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(1879–1886)

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Menlo Park Notebooks, #128 - #148

Menlo Park Notebook #128 [N-80-00-06]

This is the second of three notebooks that contain the results of a search, conducted by Otto Moses during the summer of 1880, for literature relating to the electric light. (See also Menlo Park Notebooks #127 and #176.) The citations are listed in alphabetical order by author. There are two sets of listings, beginning on pages 2 and 210. The book contains 282 numbered pages.

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Menlo Park Notebook #129 [N-80-09-09]

The dated entries in this notebook cover the period September-October 1880, but the book was probably begun earlier in the year. Most of the entries are by Francis Upton. There are also a few entries by Edison and probably by William J. Hammer. The material by Upton includes calculations about the cost of a central station; calculations about the conductors needed for the first New York central station (another member of the staff, probably Hammer, assisted Upton in gathering the statistics); and calculations concerning the location of the New York central station. The material by Edison includes calculations and drawings relating to tubes for conductors, along with calculations about the conductors needed for the New York central station. The label on the front cover is marked "Upton" and "Estimates Conductors." The book contains 284 numbered pages.

Blank pages not filmed: 174-175, 270-281.

Missing page numbers: 107-108, 223-226.

Boilers

Magnets
7.5
3"

5 20
240
800
6
4800
6.5
24000
28800
31200

140
Wire wire on magnet
140 lbs present machine
3
420
~~35~~ 38 cts per lb
126.00
33 6 0
159.6

25
18
200
25
450

Faradic Machines JM

Poles 4000 lbs. @ 4 cts	$160.
Magnet 4800 lbs	312.
Cu. Wire on magnet 420 lbs	160
Zn. castings	150.
magnets	$ 782.

Armature

Plates	$ 450.
Shaft &c page 9	350.
Commutator &c brush holders	200
Copper wire estimated	60
	1842

Labor will ~~bring it to about~~ cost $200 ~~$ 2000~~

2042

Plates 1800 @ $25. per hundred =
$450

Magnets present machine
Bars 260 lbs.
260
back 280
800 lbs.
2 times as large
1600 lbs.
3 magnets
4800 lbs.

Faradic Machines

Shaft
Sole plate
Bearings
Sleeve

TAE

Estimated Mr. K
$ 350

Faradic Machines

Faradic Machines

Iron Structure

Wood Flooring

Water heaters and pumps

Iron floors and supports.

Conductors

80

Conductors

Estimate taken from the
old one with revisions

Boilers & chimney for 1250 H.P at 3 lbs of coal	$ 21,000
Engines	21,000
Foundation	2.000
Iron Structure	3 500
Wood flooring	1 000
water heaters and pump	7.000
Iron floor and supports	6 000
Faradic machine	24000
	85.500
	50.000
	$ 135.500

5 per H.P.
6 per H.P.
7 per H.P. in current 75% back
8 per H.P.
9 per H.P.
10 per H.P.

From Thomas street to Canal Street 1600 feet 2.8 inches on large map of N.Y.

~~40 X 7~~' = 1600 feet

~~260~~ = ~~1600~~

7 = 40

7 division = 40 feet

2.8

Fire District bounded by
Wall in No. 4
all No. 6
all No. 5
To new church in No. 3

Fire District No 3

Broadway

Wall to Pine	240
Cedar	200
Liberty	175
Maiden Lane	240
	855

Nassau	855

Wall	310
Pine	310
Cedar	320
Liberty	320
Maiden Lane	330

Fire District No. 4.

Wall Street TOE

~~W~~ William to W Nassau	435 feet
W. Pearl to W. William	238
	282
	520 feet
W. Water to W. Pearl	180 feet
W. Front to W. Water	202
W. South to W. Front	270
	1607
	2
	3214
	2
	6428

TOE

Fire District No. 4

TPE

Pine Street

W. William to W. Nassau	430 feet
W. Pearl to W. William	520 feet
W. Water to W. Pearl	180
W. Front to W. Water	202
W. South to W. Front	270
	1602
	2
	3204 feet
	2
	6408

Cedar Street

W. William to W. Nassau	430
W. Pearl to W. William	520
	950
	2
	1900
	2
	3800

TPE

in District No. 4

Liberty St.

W. William To Nassau	430 feet
Maiden Lane to William	200
	630
	2
	1260
	2
	2520

Maiden Lane

W. William St to W. Nassau	455 feet
W. Pearl to W. William 300 250	550
W. Water to W. Pearl	260
W. Front to W. Water	202
W. South to W. Front	270
	1737
	2
	3474
	2
	6948

TWE

District No. 4

Nassau St.

N. Pine to N. Wall	240
N. Cedar to N. Pine	210
N. Liberty to N. Cedar	210
N. Maiden Lane to N. Liberty	210
	670
	2
	1340 feet
	2
	2680

William Street

N. Pine to N. Wall	240
N. Cedar to N. Pine	210
N. Liberty to N. Cedar	210
N. Maiden Lane to N. Liberty	200
	860
	2
	1720
	2
	3440

Fire district No. 4

TOE

Pearl Street

N. Pine to N. Wall	240 feet
N. Cedar to N. Pine	210
N. ~~Liberty~~ Maiden Lane to N. Cedar	270
	620
	2
	~~1320~~ 1240
	2
	~~1640~~ 2480

Water Street

N. Pine to N. Wall	210
N. Maiden to N. N. Pine	280
	490
	2
	980
	2
	1960

TOE

Fire District No. 4
Front Street.

N. Pine Street N. Wall St. 210
N. Maiden Lane to N. Pine 290

N. Pine Street N. Wall St.	210
N. Maiden Lane to N. Pine	290
	500
	2
	1000
	2
	2000

South Street

N. Pine to N. Wall St	210
N. Maiden Lane to N. Pine	290
	500
	2
	1000
	2
	2000

TWE

Fire district No. 5

TOE

Maiden Lane

W Gold St. to W Pearl	243 feet
W. Pearl to W. Water	274
W Water to W. Front	203
W. Front to W. Water	300
	1020

Fletcher St

W. Pearl W. Water	280
W. Water to Front	210
W. Front to South	291
	681
	2
	1362

TWE

Fire No 5 TAE

Platt Street 3,0

John St and Burling slip

Gold to Pearl	400
Pearl to Water	214
Water to Front	220
Front to South	297
	1131

$$\begin{array}{r}234\\ \times\ 2\\ \hline 468\end{array}$$

TAE

Fulton St

W Gold to Cliff	300
W Cliff to Pearl	245
W Pearl to Water	132
W Water to Front	215
W Front to South	306
	1198
	195
	1393 4
	5572

TWE

Fire No 9

Beekman St

Sold to Cliff	478
W Cliff Pearl	245
Water	208
Front	194
South	223
	1348
	4
	5392
Ferry & Peck slip	
Gold - Cliff	451
Pearl	230
Water	220
Front	200
South	196
	846
	2
	1792

TWG

Fire No 5

Frankfort & Dover

Jacob	216
Cliff	190
Pearl	225
Water	363
Front	192
Smith	192
	1378

Tal

Fire No 5

Gold Ster

N. Maiden	Platt St	233	
	John	153	
	Fulton	415	386 4
			1544
	Beekman	265	530
	Ferry	333	
	Frankfort	270	
		1669	

Jacob Street 317

TKG

Fire No 5

Cliff St

John to	Fulton	375
	Beekman	268
	Ferry	330
	Frankfort	358
		1331

Pearl St

No Maiden Lane to	Platt	300
	John	145
	Fulton	348
	Beekman	265
	Ferry	360
	Frankfort	374
		1792

TCR

Fire No 5
Water Street
Maiden Lane to Fletcher

	142
Burling Slip	250
Fulton	340
Beekman	300
Peck Slip	378
Dover	408
	1818
	408
	1410
	4
	5640

TAE

Fire No. 5

Front St

Maiden	Fletcher	133
	Burling Slip	213
	Fulton	257
	Beekman	287
	Peck slip	358
	Dover	384
		1692
		384
		1308

South St

		52
Maiden	Fletcher TAG	125
	Burling Slip	200
	Fulton	250
	Beekman	300
	Peck slip	340
	Dover	413
		1628
		433
		1215
		2
		2430

Fire No. 6.

Maiden Lane

W. Gold to W. William	330
W William to W Nassau	445
E Broadway	340

Platt Street	280
	4
	1120

John Street

TAE

W Gold to William	280
Dutch	150
Nassau	230
	690
	4
E Broadway	376 2760

Fire No 6
Fulton
W. Gold William 280
450
Nassau 380
Broadway 1110
380
730
4
2920

Ann Street
Gold to William 300
425
Nassau 350 775
Broadway 1550

Beekman St
Gold to Williams TCE 335
370
Nassau 225
Park row
Broadway 930
2
1860 280

Spruce St.

W. Gold to W. William St 370

2

400

Nassau 370

Park row

335

City Hall

Frankfort St. 380

W. Gold to W. William St 280

Park row

Tuk

Fire No. 6

Broadway

N Maiden Lane	to N John	215
	Fulton	255
	Ann	140
?.0	Beekman	500

Park Row

Ann to	Beekman	440
	Spruce	300
	Frankfort	225

TaE

Nassau Street

Maiden Lane	to John	210
	Fulton	320
	Ann	150
	Beekman	350
	Spruce	200
		1210
		4
		4840
		242?

Fire No. 6

William Street

Maiden Lane	to John	310
	Fulton	370
	Ann	140
	Beekman	235
	Spruce	250
	Frankfort 1305	220
	4	
	5220	

T.A.E.

Gold Street

Maiden Lane	to John....	{260 180,
	Fulton	390
	Ann	290.
	Beekman	
	Spruce	245
	Frankfort	310

From ~~cotee~~ centre to corner of Wall & South

to John	195
on John & Burling Slips	834
Front	346
	500
	1875 feet

Dover & South

2000 feet

~~IIII~~ II

750 places in map 5

To Herald TAE

	195
To Nassau	730
	150
	300
	1375 feet

To Times

1250 feet.

U. S. Treas 1600 feet

In Fire No. 4

Bounderies of district

South - Wall ~~and~~ Nassau -
Maiden Lane

/ / / 349 buildings

In Fire No. 5
Bounderies

Maiden Lane - Gold St -
Ferry St & Peck Slip - South St.

TAE
//// 443 Buildings

Fulton market
Fish market
Wall St & Fulton St Ferry

In ~~Fire district~~ Insurance No. 6
Maiden Lane - Nassau
Spruce - Gold

/

Houses in district bounded by
Beekman & Gold Sts and
Nassau Sts and Maiden Lane
taking a space like this as an
average size building

14 17
10 16
27
15
20
37
~~[illegible]~~
18
25
21
36
29

271

TAE

349
443
271

1063 Houses

Taking the small houses ~~by~~ as making an average with the large places and estimating a few that two houses equal one — there are about 1063 Houses in the districts as mentioned. each say 100 X 25

TAE

Counting separate houses and buildings.

In Insurance No 4

Along Wall St = 38
Bet Wall + Pine Sts = 54
" Cedar + Pine Sts = 34
Pearl, Maiden Lane,
South Pine Sts, =

TAE

Counting separate houses and buildings.

Insurance No 4

Wall, Nassau, Pine, William. = 20
20 Houses.

Wall, William, Pine, Pearl. = 23
23 Houses

Wall, Pearl, Pine, Water, = 17
17 Houses

Wall, Water, Pine, Front, = 17
17 Houses.

Wall, Front, Pine, South, = 23
23 Houses TOE

Pine, Nassau, Cedar, William = 20
20 Houses

Pine, William, Cedar, Pearl, = 32
32 Houses

Pine, Pearl Maiden Lane Water = 22
22 Houses

174

continued on next page

carried forward from page 87 174

Pine, Water, Maiden Lane, Front = 22
22 Houses.

Pine, Front, Maiden Lane South = 22
22 Houses

Cedar, Nassau Liberty - William = 22
22 Houses

Cedar William Liberty, Pearl. = 32
32 Houses

Liberty, Nassau, Maiden Lane
and William - = 26
26 Houses

Liberty William Maiden Lane = 6
6 Houses

304

Total in Ins, No 4

TWR

		Houses
Maiden Lane, Gold, Platt, Pearl,	=	28
Maiden Lane, Pearl, Burling Slip, and Water,	=	41
Maiden Lane. Water Burling Slip Front	=	9
Maiden Lane, Front Burling Slip and South	=	30
Burling Slip, South, Fulton, Front	=	14
Front, Burling Slip Fulton Water	=	21
Water, Fulton, Pearl, Burling Slip	=	16
John, Pearl, Fulton, Cliff.	=	28
Gold, John, Cliff, Fulton	=	24
John, Gold, Platt, Pearl,	=	25
Fulton, Gold, Cliff, Beekman	=	26
Fulton, Cliff, Beekman Pearl	=	26
Fulton Pearl Beekman Water	=	22
Fulton Water Beekman Front	=	20
(Fulton Market) Front, Beekman South and Fulton	=	1
Front, Peck Slip, Beekman South	=	26
Front Beekman Water, Peck Slip,	=	24
Water, Beekman, Pearl, Peck Slip,	=	33
		413

continued on next page (91)

Insurance No 5

Carried forward from page 91	=	413
Beekman, Cliff, Pearl, Ferry :	=	26
Cliff, Beekman, Gold, Ferry,	=	29
Total in Insurance No 5,		468

Tale

Maiden Lane, Gold, Platt, William = 25
Platt, Gold, William John = 13
Maiden Lane John Nassau. William = 37
John, Nassau, Fulton William 25/15 = 40
John, William, Fulton, Gold, = 24
Fulton, Nassau, William, Ann, = 15
Fulton, William, Ann, Gold = 15
Ann, Nassau, Beekman, William = 37
Ann William. Beekman, Gold = 15
Beekman, Nassau, Spruce, William = 23
Beekman, William, Spruce, Gold, = 25

Total — 269

District	4 –	304
"	5 –	468
"	6 –	269
		1041 Total

TKG

Place Station between

Platt - Gold - John - Pearl.

To supply district bounded by

Wall - Nassau - Spruce, Ferry,

Peck slip — South.

Distance to corners

South and Wall ~~1030~~ 1780 feet

Wall and Nassau 1860 — 1720

Nassau & Spruce 1820

Burling Slip & South 1820

TAE

Place Station between

Platt – Gold – John – Pearl

To supply district bounded by –

Wall – Nassau – Spruce, Ferry,

Peck slip — South.

Distance to corners

South and Wall ~~1030~~ 1780 feet

Wall and Nassau 1860 – 1720

Nassau & Spruce 1820

Burling Slip & South 1820

TWE

Distance from Station to cor of South and Wall Sts ______

Distance from station to cor of South and South Burling Slip 80
950
1030 ——— 1030

Distance from ~~Station to~~, South cor of Burling Slip to north cor South and Wall — { 330
420
750 } { 1030
750
1780 Total } ——— 750

From South Cor Burling Slip, and ~~South~~ slip, to South cor of Peck Slip — 875 ——— 875

From Station to Cor, of Spruce and Gold Sts, —

TWR

From Station to cor. of Spruce and Gold Sts, 50
170
940 ft
1160 — - - - - - - 1160

From cor Spruce and Gold to cor. Spruce and Nassau - - - - .660
1820

TWr

From Station to cor Wall and ft
Pearl Sts, – {150
310 ----
480

940. Total —— 940

Cor Wall and Pearl to corner of
Nassau ~~120~~ ~~940~~ 920
920 ~~120~~ 940
~~1040~~ ~~1060~~ 1860. Total 920
~~920~~
~~1980~~

Total 1860
ft.

TAE

From Station to Maiden Lane
through Buildings. 380 ft — 380
From cor Maiden Lane to cor
of William and Liberty Sts 380
To cor of Wall and William 540
~~From cor of Liberty and to~~
From Wall and Liberty to Wall 420
and Nassau ——— 420

- 380
- 380
- 540
- 420

1720

Total 1720 ft

TWR

TA2

No Lamp	Distance of T.L.	sq in Cross section wire	lbs of copper wire
3	1780	.00864	118.8
2	1760	.00570	77.4
3	1740	.00846	112.4
15	1720	.04819	558.5
3	1640	.00795	101.1
2	1600	.00518	64.
3	1580	.00768	93.6
3	1560	.00516	91.2
3	1540	.00747	88.8
3	1520	.00738	86.4
3	1500	.00729	84.3
2	1760	.00570	77.4
3	1740	.0087	120.
3	1720	.00861	117.3
4	1700	[illegible]	144.4
5	1690	.01375	178.5
6	1680	.01682	211.8
10	1600	.0259	320.
3	1580	.00768	93.6
10	1560	.0253	304.0
25	1520	.0625	720.
5	1510	.01220	144.4
3	1500	.00729	84.3
122		.32305	3985.1

Small	87358	Total
Medium	5360	96420
Large	3702	

TWG

Small cable

Wire No. 0".134

$\bar{1}.1271$
$\bar{1}.1271$
0.4969
$\bar{2}.7511$

sq. in. 0.0564
6 wires
.3384

1740 feet of No. 10 make in Ohm

94.6 lbs.

~~98~~
1.9759
1740 3.2405
$\bar{2}$.7354

.054 lb
6 to foot
.324
600
254.400 lbs
2
508.8 lbs Cu in lines

300
230
70
600

220 Lamps

230
180
130
390
185
1115
195
1310 feet main line
2620

Main
.0021.2
220
4240
424
.46640 sq. in.

Main
21.5
220
4300
430
4730.0 lbs cu

Small lines
230
70
300
2
600

No. 2

.054 lbs. Cu. to 1 foot

Say 1/2 lb. of ~~main~~ 0.134 diameter
i.e. No. 10 wire

6 wires make good cable

Small cable

386
386
143
137
1052 feet
40 for side walks
1092 feet
1092
2
2184
.054

2184
726 lbs.

6 wires 1/3 lb
per foot

Square No. 2

Not exact
but close

1115
40
one Main 1075 feet
2
2150
1075
− 135
930 feet from corner where
it joins other
main lines
+ 380
1310
1075
2385
Average 1192

2500 feet main

330 Lamps

.00192
330
5760
576
.63360 sq in

.65 sq. in

17.7
330
5310
531
5841.0 lbs

600 lbs

Small line
385
~~387~~
~~143~~
137
.522 \2 = 1044

Small cable

180
394
390
137

1101 feet

~~367 lbs Cu~~

1141
2

2282

760 lbs. Cu.

390
137
385
385
180
180

1637 feet small pipe

Square No. 3

300 lamps

40
180
130
390
185

925 feet main to corner

137
390

527 in small on the line

TAE

137
396

533

266 feet average to be added
925

1191

.00192
~~300~~

.57600 sq. in

17.7
300

531.00 lbs. Cu.

1 180
140
2 330
300
340
460
310
330
220
410
10 310
3110

8 220
2 330
300
4 340
5 400
6 150
7 180
230
120
230
1900

11 370
360
320
14 50
330
70
17 380
18 80
19 210
20 220
2390

21 260
22 150
23 260
24 300
25 400
26 280
27 210
28 240
2180

44 180
45 90
46 120
47 80
48 350
49 200
50 150
51 [illegible]
3?
1190

Square No. 7

Tak

29 155
30 260
31 200
32 160
33 200
34 140
35 240
1355

36 180
37 90
38 200
39 70
40 120
41 120
42 120
43 180
1100

2900
2390
2180
1190
1355
1100
11,115 lamps

3-4

Square No 1.
— " —

270 lights

390
386
195
188
1159 Total ft in block
40 ft in sidewalk
1199 Total.

145
195
39.3
137
34.8.
137.
36.1
80.
61.1
198.
40.
242.
24.2
157.5
1527.0 ft from + on no 1 to + on no 22.

TWR

145
39.3
137.
34.8
137.
36.1
80.
61.1
198.
40.
242.
24.2
157.5
1332.0 ft from – on no 1 to – on no 22

Square 2. 333 lights

143
385
137
387
1052
40 sidewalks
1092 Total

192.5
137.
34.8
137.
36.1
80.
61.10
198.
40.
242.
24.2
157.5
1340.2 from + of no 2 to + of 22

193.5
34.8
137.
36.1
80.
61.1
198.
40.
242
24.2
157.5
1204.2 ft from - of 2 to - of 22

Square 3. 300 lights

180
137
390
394
1101
40 sidewalks.
1141 Total

197
137
36.1
80.
61.10
198.
40.
242.
24.2
157.5
1173.9 ft from + of no 3 to + of no 22

197.
36.1
80.
61.1
198.
40.
242.
24.2
157.5
1035.9 ft from - of no 3 to - of 22

Square 4. — 340 lights

170
80
395
405
1050
40 sidewalk
1090 Total

197.5
80.
61.1
198.
40.
242.
24.2
157.5
1000.3 ft from + of no 4
to + of no 22

202.5
61.1
198.
40.
242.
24.2
157.5
925.3 ft from − of no 4
to − of 22

Square 5. 400 lights

178
400
884
264
1226
40 sidewalk
1266 Total

200.
198.
40.
242.
24.2
157.5
861.7 ft from + of no 5
to no 22.

19.2.
40.
125.
242.
34.2
157.5
786.7 ft from − of no 5
to − no 22

7041

Square 6. 250 lights

297
190
193
267
947
40 sidewalks
987 Total

133.5
193.
44.4
192
40.
235.
22.6
185.
1045.5 ft from + of no 6 to + of no 22.

148.5
44.4
192.
40.
235.
22.6
185. ft from - of no 6
867.5 to - of no 22

Square 7. 160 lights

64
328
300
162
854
40 sidewalk
894 Total

150
44.4
64.
40.
235.
22.6
185.
741.0 ft + of no 7 to + of 22

164
44.4
40.
235.
22.6
185.
691.0 ft from - of no 7 to - of 22.

Square 8 220 lights

119
378
110
380
987
40 sidewalks
1027 Total

190
54.3
328.
44.1
40
235.
22.6
185.
1499.0 from + of no 8
to + of no 22

189.
11.0.
54.3
328.
40.
44.1
235.
22.6
185.
1207.0 from - of no 8
to - of no 22

Square 9. 460 lights

296
376
341
185
1198
40 sidewalks
1238 Total

188.
40.2
11.0.
54.3
328.
40.
44.1.
235
22.6
185.
1247.2 from + of no 9
to + of no 22

170.5
185.
40.2
11.0.
54.3
328.
40.
44.1
235.
22.6
185.
1414.7 from - of no 9
to - of no 9

Square 10: 230 lights

188
193
300
338
1019
40 sidewalks
1059 Total

169
49.9
185.
40.2
110.
54.3
328.
40.
44.1
235.
22.6
185.
1463.1 from + of no 10 to + of no 22

150
193
49.9
185.
40.2
110.
54.3
328.
40.
44.1
235.
22.6
185.
1617.1 from - of no 10 to - of no 22

Square 11. 370 lights

188
193
487
492
1360
40 sidewalk
1400 Total

243.5
188.
23.11
108.
34.11
115.
52.10
247.
142.5
35.2
1191.4 from + of no 11 to + of no 22

246
23.11
108.
34.11
115.
52.10
247.
142.5
35.2
1092.9 ft- from - of no 11 to - of no 22

Square 12.

360 Lights

140
108
494
500
1242
40 sidewalk
1282 Total.

247.
108.
34.11
115.
52.10
247.
142.5
35.2
980.91 ft from no + 12 to + of 22

250
34.11
115
52.10
247.
142.5
35.2
877.8 ft from - of no 12 to - of no 22

Square 13.

320 Lights

130
500
498
115
1243
40 sidewalk,
1283 Total

250
115.11
52.1
247.
142.5
35.2
841.81 ft from + of No 13 to + of no 22

270
17.
25.
156
157.5
425.5 ft from - of no 13 to - of no 22

Square 14. 50 lights

70
162
180
412
40 sidewalk
452 Total.

81
52.6
134.
17
25.
156. 2/3 of side
157.5
623.1 ft from + of no 14
to + of no 22

90
52.6
134.
17
25.
156.
157.5
632.1 ft from − of no 14
to − of no 22

Square 15. 320 lights

134
268
243
17
222
884
40 sidewalk
924 Total

134.
17.
25.
156.
157.5
489.5 ft from + of no 15
to + of no 22

60.75
26.5
142.5
229.75 ft from − of no 15
to − of no 22

Square 16. 110 lights

121
122
242
235
720
40 sidewalk
760 Total.

60.5
235.
22.6
185.
503.1 ft from + of no 16 to + of no 22

61
22.6
185.
268.6 ft from - of no 16 to - of no 22

Square 17 280 lights

335
363
241
268
1207
40 sidewalks.
1247 Total

167.5
44.1
235.
22.6
185.
654.2 ft from + of no 17 to + of no 22

181.5
44.1
22.6
185.
433.2 ft from - of no 17 to - of no 22

Square 18. 80 lights

112
120
258
258
748
40 sidewalk
788 Total

129.
54.6
363.
44.1
122.6
185.
798.3 from + of no 18
to + of no 22

129
120
54.6
363.
44.1
22.6
185.
918.3 ft from - of no 18
to - of no 22

Square 19. 210 lights

180
95
262
290
827
40 sidewalk,
867 Total

TW

131.
40.2
120.
54.6
363.
44.1
22.6
185.
960.5 ft from + of no 19
to + of no 22

145.
95.
40.2
120.
54.6
363.
44.10
22.6
185.
1069.50 ft from - of no 19
to - of no 22

Square 20. 220 lights

192
191
298
320
1001
40 sidewalk.
1041 Total

149.
49.5
95.
40.2
120.
54.6
363.
44.1
22.6
185.
1123.0 ft. from + of no 20
to + of no 22

160
191
49.5
40.2
120.
54.6
363.
44.1
22.6
185.
1230.0 ft. from - of no 20
to - of 22

Square 21. 260 lights

234
224
285
247
990
40 sidewalk
1030 Total

117
142.5
35.2
294.7 from + of no 21 to
+ of no 22

123.5
142.5
35.2
301.2 from - of no 21
to - of no 22

Square 22. 140 lights.

117
109
315
370
911
40 sidewalk
951 Total

central station block
measure of block in ft.
only needed. –

Square 23. 260 lights

370
335
155
275
1135
40 sidewalk
1175 Total.

77.5
44.9
44.8
177.2 ft. from + of no 23
to + of no 22.

137.5
335.
44.9
44.8
562.2 ft from – of no 23
to – of no 22

TAE

315

Square 24. 300 lights

286
370
215
218.
1089
40 sidewalks
1129 Total.

143
48.4
335.
44.9
44.8
616.1 ft from + of no 24 to + of no 22

185.
218.
48.4
335.
44.9
44.8
876.1 ft from – of no 24 to – of 22

Square 25. 450 lights

282
285
378
428
1373
40 sidewalks.
1413 Total

189.
50.8
218.
48.4
335.
44.9
44.8
930.9 ft from + of no 25 to + of no 22

214
285
50.8
218.
48.4
335.
44.9
44.8
1240.9 ft from – of no 25 to – of no 22

Square 26. 290 lights

193
204
320
297
1014
40 sidewalk.
1054 Total.

148.5
193.
44.8
386.3 ft from - F no [illegible]
to - no 22

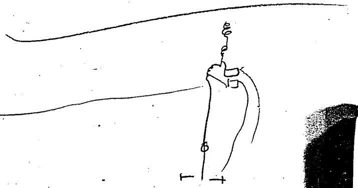
160
44.8
204.8 ft from + F no 26
to + F no 22

Square 27. 210 lights

222
218
202
198
840
40 sidewalk
880 Total

111
48.7
320.
44.8
524.5 ft from + F no 27
to + F no 22

109
48.4
297.
193.
44.8
692.2 ft from - F no 27
to - F no 22



Square 28. 260 lights

285
331
195
188
999
40 sidewalk
1039 Total.

142.5
53.6
222.
48.7
320.
44.8
831.6 ft from +' of no 28 to +' of no 22

165.5
53.
218.
48.4
297.
193.
44.8
1019.7 ft from -' of no 28 to -' of no 22

Square 29. 155 lights

138
168
179
187
672
40 sidewalk.
712 Total

69.
179.
25.9
244.
67.
88.
37.4
160.
142.5
35.2
1048.0 ft from + of 29 to + of 22

84.
25.9
244.
67.
88.
37.4
160.
142.5
35.2
884.0 ft from - of no 29 to - of no 22

TaE

Square 30. 320 lights

244
225
174
213
856
40 sidewalks
896 Total.

87.
224.
67
88
37.4
160.
142.5
35.2
861.1 ft from + g no
to + g no 22

106.5
67.
88.
37.4
160.
142.5
35.2
636.6 ft from - g no 30
to - g no 22

Square 31. 160 lights

232
246
88
84
650
40 sidewalks
690 Total.

116.
88.
37.4
160.
142.5
35.2
579.1 ft from + g no 31
to + g 22

123
37.4
160.
142.5
35.2
498.1 ft from - g 31 to
- g no 22

R. G.

Square 32. 160 lights

249
227
176
240
883
40 sidewalk.
923 Total

120
124.5
50.1
142.5
35.2
472.3 ft from + [illegible]
to + of no 22

88.
124.5
50.1
142.5
35.2
440.3 ft from − of no 32
to − of 22

Square 33. 150 lights

155
97
287
270
809
40 sidewalk.
849 Total

77.5
49.1
45.17
185.
356.77 ft from + of 33 to + of
no 22

48.5
287.
49.1
45.1
185.
614.7 ft from − of 33
to − of 22

[illegible]

Square 34. 150 Lights

193.
167.
211.
219.
790
40 sidewalk.
830 Total

96.5
47.6
287.
49.1
45.17
185.
710.37 ft front of no 34
to ' of no 22

83.5
219.
47.6
287.
49.1
45.17
185
916.37 ft from ' of no 34
to ' 22

Square 35. 240 Lights

310
330
167
186
993
40 sidewalk.
1033 Total.

83.5
49.5
219.
47.6
287.
49.1
45.17
185.
965.87 front of no 35 to
' of no 22

93.
310.
49.5
219.
47.6
287.
49.1
45.17
185
1285.37 ft from ' of no 35
to ' of 22

T.A.G.

Square 36.

180 Lights

188
192
158
156
694
40 sidewalk
734 Total

79
188.
24.1
59.
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1312.71 ft from + of 36 to + of no 22

78
24.1
59.
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1123.71 ft from - of no 36 to - of no 22

Square 37.

90 lights

59
50
157
155
421
40 sidewalk
461 Total

78.5
59.
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1100.11 ft from + of 37 to + of 22

77.5
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1040.11 ft from - of no 37 to - of no 22.

TAE

Square 38. 160 Lights

135
134
153
155
577
40 sidewalk
617 Total

76.5
135.
63.11
80
23.4
45.
240.
124.5
50.1
142.5
35.2
1015.31 ft from + of no [illegible] to + of no 22

77.5
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
881.31 ft from - of no 38 to - of no 22

Square 39. 90 Lights

157
80
163
79
479
40 sidewalk
519 Total

78.5
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
819.2 ft from + of 39 to + of no 22

81.5
23.4
45
240.
124.5
50.1
42.5
35.2
642.2 ft from - of 39 to - of no 22

[illegible]

Square 40. 90 lights

196
163
177
189
725
40 sidewalk
765 Total.

81.5
45.
240.
124.5
53.1
142.5
35.2
719.8 ft from + of no 40
to + of no 22

88.5
44.9
176.
51.4
185.
545.8 ft- from - of no 40
to - of no 22

Square 41 150 lights

215
205
166
158
744
40 sidewalks.
780 Total

83.
49.9
155.
49.1
193.
44.8
574.8 ft- from + of 41 to
+ of 22

79.
215.
49.9
155.
49.1
193.
44.8
785.8 ft- from - of no 41
to - of no 22

[illegible]

Square 42. 120 lights

141
141
194
194
670
40 sidewalks.
710 Total

70.5
100.3
79.
215
49.9
155.
49.1
193.
44.8
956.6 ft from + of no 42 to + of no 22

70.5
194.
100.3
215.
49.9
155.
49.1
193.
44.8
1071.6 ft from - of no 42 to - of no 22

Square 43. 180 lights

296
296
145
144
881
40 sidewalks.
921 Total

72.5
60.1
194.
100.3
215.
49.9
155.
49.1
193.
44.8
1133.7 ft from + of no 43 to + of no 22

72.
296.
60.1
194.
100.3
215.
49.9
155.
49.1
193.
44.8
1429.2 ft from - of no 43 to - of no 22

Square 44 220 lights

196
194
214
220
824
40 sidewalks
864 Total

110.
24.1
55.
23.8
123.
84.3
52..
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1342.3 ft from - of no 44
to - of no 22

107.
194.
24.1
55.
23.8
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1533.3 ft from + of no 44
no + of no 22

Square 45. 90 lamps

55
52
222
223
552
40 sidewalks
592 Total.

111.5
23.8
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1264.7 ft from - of no 45
to - of no 22

111
55
23.8
123.
84.3.
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1619.2 ft from + of no 45
to + of 22.

Square 46. 120 lights

223.
227
114
123
687
40 sidewalk
727 Total.

111.5
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1240.9 ft from + G no 46
to + G no 22

113.5
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1119.9 ft from - G no 46
to - G no 22

Square 47. 80 lights

52
43
230
230
555
40 sidewalks.
595 Total.

115.
52
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1037.1 ft from + G no
47 to + G no 22

115
22.2
66.6
163
44.9
240.
124.5
51.4
157.5
985.1 ft from - G no 47
to - G no 22

Square 48.

230 lights

185
177
234
240
836
40 sidewalk
876 Total

117.
185.
66.6
177.
44.9
196.
124.5
51.4
157.5
1079.9 ft front + of no 48
to + of no 22

120.
66.2
177.
44.9
176.
124.5
51.4
157.5
917.5 ft front - of no 48
to - of no 22

Square 49.

200 lights

148
115
244
250
757
40 sidewalk
797 Total

122.
48.11
68.33
166.
49.9
49.1
193.
44.8
791.24 ft front + of 49
to + of no 22

125.
48.11
155.
215.
49.9
155.
49.1
193.
44.8
1037.91 ft front - of no 49
to - of no 22

Square 50. 150 lights

222
225
198
187
832
40 sidewalks
872 Total,

93.5
50.4
194.
70.5
92.6
158.
215.
49.9
155.
49.1
193.
44.8
1365.8 ft from - of no 50
To - of no 22

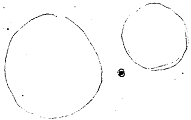
99.
51.
76.5
92.6
158.
215.
49.9
155.
49.1
193.
44.8
1177.9 ft from + of 50
To + of 22

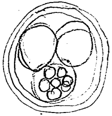
Square 51. 140 lights

285
286
160
140
871
40 sidewalks..
911 Total..

70
285.
50.4
145.
60.1
194.
1[illegible].3
79.
215.
49.9
155.
49.1
193.
44.8
1690.6 ft from - of 51
to - of 22

62.
93.5
50.4
194.
70.5
92.6
158.
215.
49.9
155.
49.1
193.
44.6
1437.8 ft from + of 51
to + of 22





Sept 9 1880 TAE —

Length of distributing tubes —

~~1199~~

D 599.

DYN. 599.

M 39

	Distributing	Wire	Distributing & Main	Main.	~~Main for Square~~
Block 1	599.		599.	39.	
2	546.	1	546.		

TAE

51

6

J. Ph

Oct 15 1880

Distributing.

599
546
570 — 1715
545
633
493 — 1671
283
513
619 — 1415 — 4801
529
700
641 — 1870
890
226
684 — 1800
122
676
394 — 1092 — 4862
433
520
341 — 1294
125
507
564 — 1196
706
204
440 — 1350
710
356
448 — 1514
345
227
425 — 997
415
516
367 — 1298
230
308
155 — 693

716
3840
5502
4862
4801
1098
1098
1204
530
23651
2
47302
5502

3
4
3

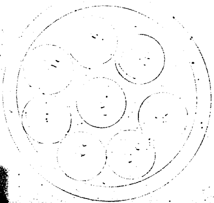
~~155~~
466
180
70 — 716
370
432
296 — 1098
363
297
438 — 1098
398
436
370 — 1204
530

J. Ph

Oct 15 1880

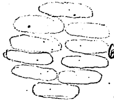
23650.

56



Total

950
60
35



67
9
603

21) 1700 (8.90
168
20

28) 2900 (100
28
10

23651
47302
85
236510

56) 3500 (62 1/2
336
140
112
28

21) 1700 (80
168
2900

28

21

47302
40
1892080

2

17 40
3

Oct 15 1880

17. 21

34
18
272
34
612

46) 75 (1
46
29
6

750

750
46
29

67
7
469

21
25
105
42
525

7 | 168
24.

15 | 84. (5
75
9

15
7
105

15.

8.

15
5
75

1
2
3
4
8
5
7
6
9
14
13
10
11
12

Oct 15 1880

14
7
98.

14
7
98

1500

50 | 5000 (100.
50
0

2 100.
2½ 80.
3. 62½
4 100.

67
33
100

50

18. 1½

17.

2 inch pipe. c 17 — 21/170/8 mills
168
2.
21 wires, 1e 3 of 7

2 1/2 pipe. — c 29 — 28/290/10 1/2 mills
252
28 wires,

3 inch pipe — 35 — 56/350/6 — 6 1/4 mills
336
14
56 wires.

4 inch — cents 50. — 98/500/5 mills — 5 mills per wire
490.
98 wires.

Oct 15 1880
TAE

Cost of 47.302 feet distributing pipes 2 inch diameter (no mains) 17c for pipe 17c for rubber 34 Cents.

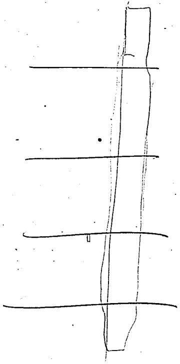
$16,082.$\frac{68}{100}$

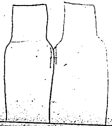
Oct 15 1880
TAE

Mains + Dis + Mai

... Wires.	feet.
11 + D	620

Oct 18 1880
TAE

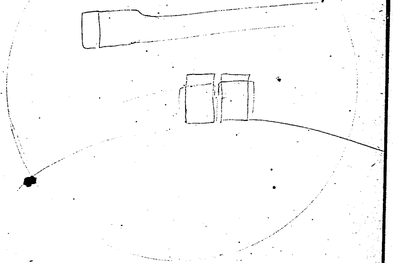


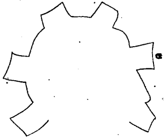


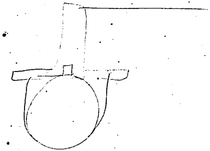
Total of distributing pipes
without mains -

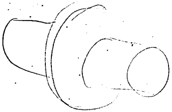
.23651.

Oct 15 1880
TAE



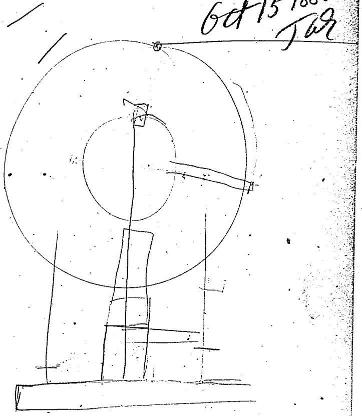




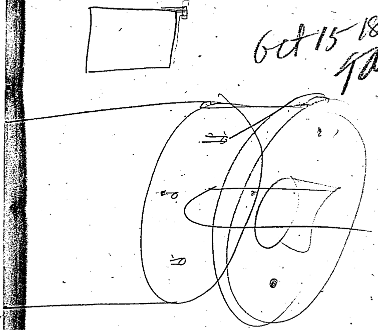


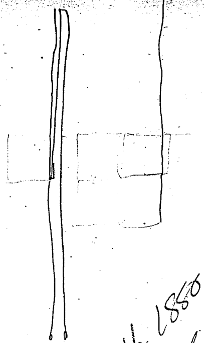
Weights of [illegible] lines

Oct 15 1880
TAE

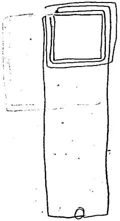


Oct 15 1880
TAE

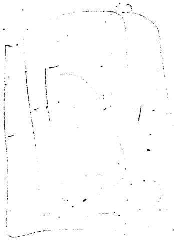




Oct 16 1880
Jkh

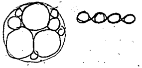


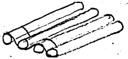
Oct 16 1880
TAE

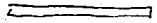


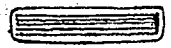
123.

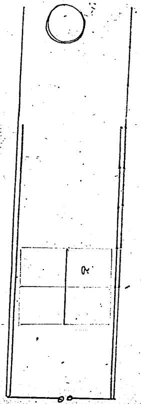
80
45
125



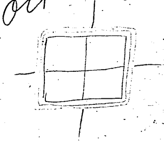








oct 16 1880
TAE



1.2825. No 2 25-

.5460 -28

11

22

47302
22
94604
94604
1040644

190

6

16

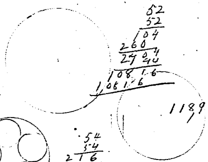
6 1/3

13 each

12

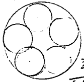
47302
13
141906
47302
614926.

52
52
104
260
2704
1081.6
1081.6



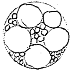
118976.

16.
22
35.



1 1/2

.54
54
216
270
2916
11664
11664
128304

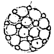


Oct 16 1880 TAE

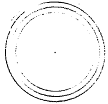
8 wires

12
9

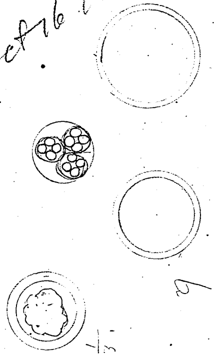
14.

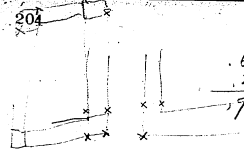


13/20



Oct 16 1880 TAE





.6615
.2940
.9555

.7326
.3596
1.0832

6934
7326
1.4260

.2997
.7326
1.0323

2820
6750
9570

+ .9754
.6750
1.6504

97

.7582
.6750
1.4332

No. Feet	Cross Section 100 Ohms	No. Wires ~~100 Ohms~~ 200 Ohms	Size mm
1. 1858	.6615		24
410	.9953		36
203	.9555		34
20	.3338		12
20	.2940		10
2 1538	.7326		26
202.5	1.0832		39
157	1.4260		50
157	.5092		18
612	1.0323		37
+ 14	.6934		24
– 14	.5092		18
3 1400	.6750		24
207	.9570		34
157	1.6504		59
157	1.4332		54
205	.2490		9
+ 16	1.2508		44
– 16	1.0098		36

~~.2726~~
.7480
.2754
1.0234

1.250
.7480
1.4980

.2516
.7480
.9996

1.0098
.7480
1.7578

.2820
1.040
1.3220

1.52684
1.040
2.56684

1.0418
1.04
2.0814

.3085
1.040
1.3485

.2070
1.040
1.2470

.987

2

.5125
.1750
.6875

.2125
.5125
.7250

4 Feet Cross section — No Wires 200 Ohms.

4	2549	.7480	26
	207	1.0234	36
	10.0	1.9980	71
	100	1.7578	62
	205	.9996	36
	41	1.2508	44
	41	1.0414	37
5	1818	1.040	37
	210	1.3220	47
	386	2.5668	91
	386	2.0818	74
	202	1.3485	48
	202	1.2470	The 44 struck down not counted
6	1540	.5125	18
	218	.7250	26
	158	.6875	24
	24	.2125	8
	24	.1750	6

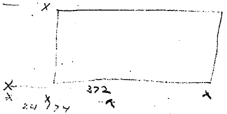
KA

.2880
.0960
.3840

3

1.2438
.2880
1.5318

348
24
372



.271
1.150
1.421

.215
.42
.635

.42
.266
.686

.826
1.150
1.976

.736
.42
1.156

~~1.002~~

186
198

1.041
.420
1.461

.524
1.150
1.674

.465
1.150
1.615

1633

	Feet	Cross section	Ohms
7.	1012	.2880	10
	160	.3840	13
	174	1.53.18	55
	174	1.2438	44
	372	1.1399	40
	24	1.2438	44
	24	.0960	4
8	1589	.420	2
	200	.686	3
	199	.635	3
	130	1.556	41
	130	1.461	52
	34	1.022	36
	34	1.041	37
9	1633	1.150	.41
	198	1.615	.57
	180	1.674	.59
	195	1.421	.51
	195	1.976	.70
	20	.736	3
	20	.826	3

1589
50
193
20
1862

1059
524
50
193
20
1846

.271
.483
.754

193
20
10
30

1054
.316
1.370

.301
.483
.784

1.054
.355
1.409

12

.9360
.284
1.220

~~930~~
~~260~~

.352
936
1.288

255
.936
1.191

.386
.936
~~1.292~~
1.242

.680
.936
1.576

	Feet	Cross Section	No Wires
10	1846	.4830 —	17
	179	.754 —	27
	373	.784 —	28
	30	.271 —	10
	30	.301 —	11

Tak

11	2298	1.054 —	37
			50
	461	1.409 —	49
	256	1.371 —	13
	20	.355 —	11
	20	.316 —	

12	1819	.9360 —	33
	257	1.220 —	43
	260	1.191 —	42
	118	1.576 —	56
	118	1.242 —	44
	14	.639 —	23
	14	.571 —	20

.832
.218
1.050

.571
.832
1,403

.8572
.832
1,689

81 ½
10
91

81

VI

Feet Cross section

13	2100	.832	30
	260	1,050	87
	135	1,403	30
	135	1,689	60
	32	.857	30
	32	.571	20
	110	.108	4
14	738	.045	2
	91	.0250	1
	100	.0255	1
	32	.0250	1
	32	.0253	1
15	1675	.5920	21
	181	.1248	4
	121	.0576	2
	10	.1499	5
	10	.1343	5

1247

16.

1183	.1705	6
325	.04440	2
71	.0232	1
285	1.7668	62
255	1.3781	48
24	1.5963	56
24	1.3469	48

17.

2422	.7800	25
.177	1.1138	40
191	1.1842	42
251	1.5963	57
191	1.1842	42

18

1096	.1240	4
139	.1760	6
139	.1832	6
138	.5378	19
130	.5554	20
20	.4138	15
20	.4314	13

19

1226 — .3780 — 13
141 — .5256 — 19
145 — .5592 — 20
105 — .7398 — 26
105 — .7566 — 27
30 — .3618 — 13
30 — 3786 — 13

K L

20

1561 - .4620 — 16
159 - .66~~00~~ — 24
170 - .67 76 — 24
201 - .1980 — 7
201 - .6776 — 24

21

1595 —(5460 — (19) above 15 — (65) 1.8463
127 — .6058 — (21) 1.5 — (82) 2.30611
133 — .6184 (22) 15 (84) — 2.3688
below 15 (66) 1.87905

above station < 15.2 — 2.38634 (85)
15.2 — 2.85211 (101)
below station < 15.2 — 2.91455 (103)
15.2 — 2.42503 (86)
15
15

22

Aor

only 1/2 - 495' — 2730 — 10

left side above 167 — 1.8403 — 65
167 — 2.3061 — 82

right side above 195 — 2.36855 — 84
195 — 1.87985 — 66

left side below 167 — 2.36853 — 84
167 — 1.87905 — 66

right side below 195 — 1.2822 — 46
195 — 1.8180 — 64

25 — 2.5340 — 90
25 — 2.6313 — 93

23.

1436. — .6110 — ~~22~~
87. — .6474 — 23
144. — .7280 — 26
355 — .5239 — 19
355 — .7770 — 27
28 — 1.1349 — 40
28 — 1.388 — 49

24. Nor

4459 — .6750 — 24
153 — .8250 — 29
195 — .8850 — 31
238 — 1.1725 — 42
238 — 1.3350 — 47
31 — .4875 — 17
31 — .6600 — 24

25. 2179 — 1.2825 — 45
199 — 1.62 — 57
224 — 1.732 — 61
295 — 1.6200 — 58

1894 — .6090 — 22
26. 170 — .6554 — 23
158 — .6679 — 24
213 — 1.2822 — 46
213 — 1.8185 — 64
28 — .2624 — 9
~~288 — .3308 — 12~~

The next two pages scribbled on were torn out by Hammer, contained nothing important. —

HOE

27.

1592	.4305	15
121	.5187	18
119	.5481	19
28	.1742	6
28	2132	8
	.5460	19

28.

1823	.1781	6
152	.3176	11
175		

29.

1128.	.22475	8
278	.3565	13
94	.33480	12
Steel 15	.13175	5
15	.11085	4

30.

1404 —	.576 —	20
361 —	.9968 —	28
116 —	.7424 —	26
142 —	.92855 —	33
142 —	.75245 —	26
67 —	.35255 —	13
67 —	.17645 —	6

31.

955 —	.224 —	8
126 —	.2992 —	10
133 —	.2880 —	10
108 —	.65175 —	23
108 —	.46445 —	16
17 —		
17 —		

32.

1444 —	.2960 —	10
232 —	.3568 —	13
264 —	.3520 —	13
260 —	1.4404 —	51
260 —	1.2594 —	45
30 —	2.36855 —	84
30 —	1.87985 —	42

33.

1024 — .2960 — 10
87 — .2985 — 10
58 — .3285 — 11
307 — .5712 — 20
307 — .5831 — 21
28 — .3162 — 11
28 — .3281 — 11

34.

1059 — .2550 — 9
100 — .3403 — 12
93 — .3660 — 13
239 — .5277 — 19
239 — .3660 — 13
29 — .2727 — 10
29 — .1110 — 4

35.

1609 — .1033 — 4
94 — .6912 — 24
82 — .7512 — 27

36.	1161 —	.2610 —	9
	89 —	.4518 —	16
	88 —	.4230 —	15
	14 —	.1908 —	7
	14 —	.1620 —	6
37.	751 —	.0955 —	3
	88 —	.1756 —	6
	87 —	.1711 —	6
	79 —	.3664 —	13
	79 —	.3331 —	11
	13 —	.2709 —	10
	13 —	.2376 —	8
38.	818 —	.1920 —	7
	86 —	.2251 —	8
	85 —	.2091 —	7
	155 —	.5925 —	21
	155 —	.5430 —	19
	43 —	.4005 —	14
	43 —	.3980 —	14

39.

TAE

	698	.0945	3
	88	.1549	6
	91	.1413	5
top and block	100	.6554	20
	100	.4925	18
across the street	22	1.0836	39
	22	.8794	31
side on which other mains pass	183	.5618	20
	183	.5482	19

40.

400	.1395	5
91	.1917	7
91	.1791	6
197	.3462	12
197	.3493	12
25	2067	7
25	2098	7

41. Rae

1012 — .2325 — 8
93 — .3015 — 11
89 — .3285 — 11
235 — .7948 — 28
235 — 1.1630 — 41
72 — .2574 — 9
72 — .3102 — 72

42. 1368 — .1740 — 6
80 — .2676 — 9
80 — .2772 — 10
214 — .4314 — 15
214 — .4842 — 17
40 — .2574 — 9
40 — .3102 — 11

43. 1513 — .3330 — 12
82 — .4968 — 17
82 — .5400 — 20

44.

1356 — .3960 — 14 +
117 — .6688 — 24
120 — .6336 — 22
214 — .6688 — 24
No-main 14 — .2728 — 10
14 — .2376 — 8

764 — .1080 — 4
121 — .2034 — 7
45. 121 — .2008 — 7
79 — .4762 — 17
79 — .4374 — 15
13 — .3682 — 13
13 .3294 — 12

1001 — .1740 — 6
121 — .2940 — 10
46. 123 — .2820 10
143 — .6622 23
143 — .6114 22
64 — .4882 — 17
64 — .4374 — 15

Tae

47	875	.0960	3
	125	.1632	6
	125	.1600	6
	72	.6714	24
	72	.6114	22
	47	.5618	20
	47	.5018	18
48.	1374	.4500	16
	334	.6567	23
	130	.6202	22
	205	.6567	23
	→ Ti minus 30	.2067	7
	30	.1702	6
49	1403	.3200	11
	187	.4480	16
	125	.4880	17
	28	.1280	4
	28	.1680	6

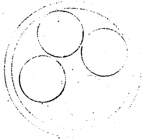
50. TAE

1558 — .2700 —— 10
107. .4125 —— 15
103 .4365 —— 15
30 .3049 —— 11
30 .1665 —— 6

1487 — .2590 —— 9

51. at point [illegible] .4012 —— 14
notch —
385 — .4508 —— 16
30 — 1422 —— 5
30 — 1918 —— 7

2 inch 28 wires



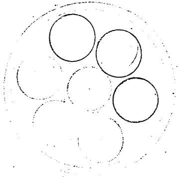
TAE

Oct 16 1880

inch

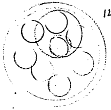
7 wires

2 1/2 inch 49 wires



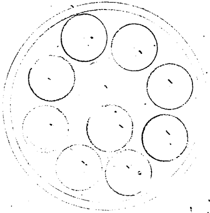
1 1/2

14 wires
2=7s



3 inch

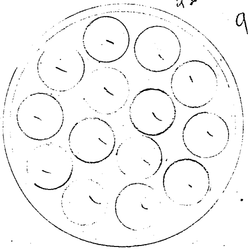
70 wires



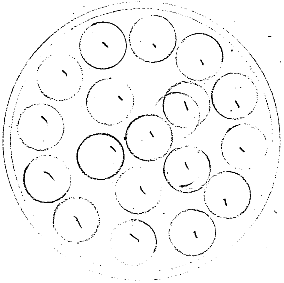
Oct 16
1880
TAE

3½ inch

98 wires



Oct 18 1880
Jar
4 inch
126 cones



3) 16632
5544

$\frac{1}{3}$

16632
6
99792
5544
1.053.36

95

18121
11
18121
18121
1.9933

1262
32
2524
3786
403.84

2201
32
4402
6603
704.32

386
42
772
1544
162.12

18487

1129
42
2258
4516
474.18

3304
25
15320
6128
766.00

304
50
152.00

18487
15
92435
18487
277305
6162
2.834.67

125

329
42
658
1316
138.18

3) 24017
15
120085
24017
360255
800
3.610.55

25
42
50
100
10.50

8

1999
32
3998
5997
639.68

11661.
25
58305
23322
2915.25

4690
25
23450
9380
1.172.50

Sizes of pipes on the plan of working Each block - seperate,

1.053.36	16632	1 inch
1993.31	18.121	$1\frac{1}{2}$ inch
2,834.67	18487	2 inch
3.610.55	24017	2 inch
766.00	3064	$2\frac{1}{2}$ inch
2915.25	11661	$2\frac{1}{2}$ inch
1172.50	4690	$2\frac{1}{2}$ inch
704.32	2201	3 inches
639.68	1999	3 inch
403.84	1262	3 inch
162.12	386	$3\frac{1}{2}$ inch
474.18	1129	$3\frac{1}{2}$ inch
138.18	329	$3\frac{1}{2}$ inch
10.50	25	$3\frac{1}{2}$
152.00	304	4 inch
16770.46	104307	

Oct 16 1880
TAE

6

4576

16770.46
2
33.54
.
33.54
22
5.55

H lamps

1267 — 270 —
50
90
20
20
70
70
40
75
705 lamps

.10 | 705
70

201.5
70
1410.50

Oct 16 1880
Jhd

H
920.

50
150
20
20
70
70
40
40
150
80
80
40
50
30
100
30
100
50
1150 lamps

10 | 1150.
115

115
105.8
920
115
1242.0

91
669.

60
110
100
40
50
20
20
50
90
50
40
630

Oct 16 1880
Tax

10/630
63

63
49.6
378
567
252
3124.8

1082.

80
60
60
10
10
20
150
20
40
150
30
50
80
40
800

10/800
80

80
72.31
5784.80

1466.

Lamps

120
100
90
40
60
35
80
30
60
20
30
50
60
90
80

970

100
100
100
150

450

884.

$10\overline{)970}$
97

270.1
97
18901
24309
261991

$10\overline{)450}$
45

96.8
45
4840
3872
43560

848.

Lamps

80	$10 \overline{)380}$
50	3.8
50	
80	
80	
40	
380	

TM

$$
\begin{array}{r}
90.3 \\
38 \\
\hline
7224 \\
2709 \\
\hline
3431.4
\end{array}
$$

407.

30
200
40
270

220.

Lamps.

$10 \overline{)450}$ 45

50
20
50
40
60
50
10
60
50
40
10
10
450

$$
\begin{array}{r}
6.05 \\
45 \\
\hline
3025 \\
2420 \\
\hline
272.25
\end{array}
$$

$\frac{H}{20.}$

Lamps

KWR

396.

Lamps

10	$10\overline{)360}$
100	36
50	20.
70	720.
40	
20	
40	
360	

81
765

Lamps

140
40
70
40
150
80
75
100
40
735

10/735
73

72.2
73
2166
5054
5270.6

4 pr

91
1162

40
140
90
40
30
60
40
180
620

10/620
.62

168.
.62
336
1008
10416.

91. Lamps.

794.

50	$10\overline{)700}$	
80	70	
50		
160		
90	78.0	
80	70	
70	5460.0	
120	5	
700		

91.

225.

	$10\overline{)610}$
50	61
60	
180	6.05
60	61
10	605
10	3630
60	369.05
100	
80	4
610	

Dr
660

Lamps
90
150
80
200
150
670

Kue

10/670
67

54.4
67
3808
3264
3644.8

Dr
758

70
70
60
60
150
410

10/410
41

72
82
287
2952

Dr
1102

20
80
20
120
60
140
440

10/440
44

151.2
44
6048
6048
6652.8

1410.50
1242.
3124.8
5784.8
26199.1
4356.
3431.4
272.25

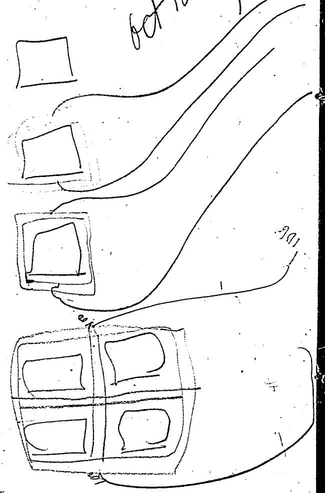
KVR

2. H. Blank

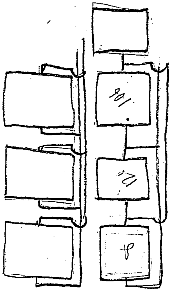
720.
5270.6
10416.
5460.
369.05
3644.8
2952.
6652.8

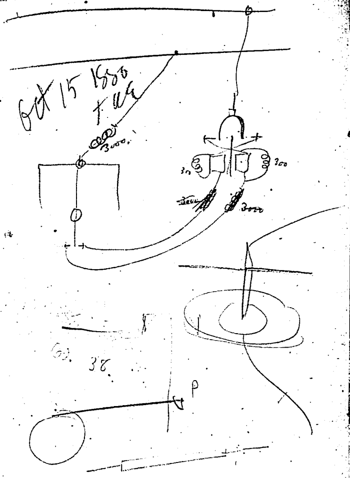
81306.10 Total miles

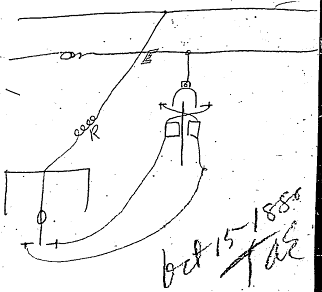
Oct 15 1880
TAE



Oct 15 1880
TAE




Oct 15 1880
T A E
3000
300
300
3000
38
P


E
R
Oct 15 1880
T A E

Menlo Park Notebook #130 [N-81-00-02]

This notebook is undated but was probably used late in 1880. All of the entries are by Otto Moses. They probably relate to books and periodicals that were to be ordered for Edison's library as a result of Moses's search for literature about the electric light. Included also are a few clippings relating to technical publications. The label on the front cover is marked "Book & Periodical" and "Orders & Memoranda." The book contains 284 numbered pages.

Blank pages not filmed: 2-3, 18-284.

Chemistry. Essai de Méchanique Chemique ✓ fondée sur la Thermochemie
M. Berthelot II. Vols. (Paris. Dunod.)

Catalogs. Westermann, B., Broadway N.Y.
Catalogue of foreign publications and
received periodicals.

" Christern —, University Place N.Y.
Catalogue of foreign publications and periodicals. He has been ap-
Ordered -pointed by Paris house to receive sub-
-scription to Comptes Rendus.

✓ Electricity Gordon, Electricity & Magnetism.

Chemistry - Chemical Physics, Heat, Light and Electricity. 550 pages $3.00.
Pynchon, T. R. (250 Engravings)

Chemistry Fresenius, Zeitschrift der Analyt. Chem ✓

Electricity. The employment of Electromagnetism ✓ Steinheil, 1873. (German)

Electricity Electrotechnical Journal (German)
Zetzsche Dr. K.Ed. Editor.

✓ Wiener Akademie Anzeiger.

Electricity The latest advances in the province of electric lighting and transmission of power.

" The electric transmission of power.
Higgs, Paget. E & F.N. Spon.

Technological Dictionary, E. French & Germ.
Tolhausen, Alex.
✓ Tauchnitz, Leipzig.
Sampson Low & Co. London.

✓ Thompson & Tait's Natural Philosophy

Miller's Chemical Physics.

Maxwell's Electricity and Magnetism.

Wormell's Dynamics.

✓ Common sense for gas users.
Robt Wilson … 2nd Ed.

Asa Gray's Flora of the U.S.

The fibrous plants of India [1855.]
Dr. Forbes Royle. also a paper by
Dr J. Forbes Watson, May. 9. 1866
on the same subject. Dr W. is Reporter
on the Products of India.

Four lectures on static induction.
Gordon, J.E.H.

Culley's Hand book of Electricity?

Technical Dictionary in English.

= Holzapffel, 3 first vols. . at Wiley's I saw copy.

" Airy, G.B. A treatise on magnetism.

Les Mondes.

The choice of books.
Chas. F. Richardson
To appear from American Book Exchange

—

✓ Wiedermann's Galvanismus + Magnetismus

—

Clark-Maxwell –

—

✓ Poggendorf's Handwörterbuch, Biogr.

—

"Japan." Sir Edwin J Reed K.C.B.
"almost profusely illustrated

✓ Miller's, Chemical Physics.

—

Royal Institution Proceedings

—

✓ La physique moderne. Les principales applications de l'Electricité.
E. Hospitalier.
133 ~~plates~~ + illustrations + 4 plates

Prof. Willis "Principles of Mechanism".
Culmann's "Graphische Statik".

The Principles of Graphic Statics. By G. S. Clarke, Lieut. R.E. London: E. and F. N. Spon. 1880.

This work will meet a want which has made itself felt for some time. Though the subject of graphic statics is valuable, not merely as a means to an end, but as a part of mental training, its study has not found much favour in this country. The graphic method is the complement of the analytical process, and the power conferred by it is at the disposal of those who have had but little mathematical training. In the great engineering schools of the Continent the subject is deemed worthy of a professorial chair, and it is systematically taught; in England, on the contrary, it is left to the teacher to introduce it in an almost haphazard way. The author has endeavoured in the present work to avoid the abstract character of the numerous foreign treatises and the too practical treatment the subject has received in England. He trusts that it may lead some of his readers to a further prosecution of a fascinating study, in which much still remains to be done. The book has been very judiciously divided into ten short chapters; and the appendix which has been added contains tables giving the weights and strength of materials. By the help of these tables it will be found possible to apply the various constructions to actual practice. The plates which are given at the end of the book are very clear, and easy to follow. They help to make the work a valuable addition to the library of the engineer.

✓

Insect? Enemies (The) of Books. By W. Blades. 2nd edition. Crown 8vo. Trübner and Co.

"L'Electricité" 20 francs a year.

Electric Meteorology. By G. A. Rowell. Oxford: Slatter and Rose.

Popular Lectures on Scientific Subjects. By H. Helmholtz. Translated by E. Atkinson, Ph.D., F.C.S. Second series. London: Longmans, Green.

U. S. Patent Office.

Australia

Ferdinand Mueller

Vétillart – Sur les fibres vegetales employés dans l'industrie

Paris et Londres

Firmin-Didot

BOOKS ON CHEMISTRY,

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"To the best of our knowledge it is the most complete, practical, and thorough-going treatise on the subject to be met with in any language."—*Chemical News, June 27th*, 1879.

Experimental Researches in Pure, Applied, and Physical Chemistry. By E. FRANKLAND, Ph.D., D.C.L., F.R.S., Professor of Chemistry in the Royal School of Mines, &c. In One Volume (1,047 pages). 8vo., £1 11s. 6*d*.

Destructive Distillation:— A Manualette of the Paraffin, Coal Tar, Rosin Oil, Petroleum, and Kindred Industries. By EDMUND J. MILLS, D.Sc. (Lond.), F.R.S., "Young" Professor of Technical Chemistry in Anderson's College, Glasgow. 8vo., 2*s*. 6*d*.

Chemistry:—General, Medical, and Pharmaceutical; including the Chemistry of the British Pharmacopœia. By JOHN ATTFIELD, Ph.D., F.C.S., Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, &c. Sixth Edition. Illustrated. Post 8vo., 15*s*.

"The work holds a high rank in England, and as a handbook for the medical student and the pharmacist we know of nothing better in English." *Boston (U.S.) Journal of Chemistry*.

Lecture Notes for Chemical Students. By PROFESSOR FRANKLAND. Second Edition. Vol. I. (Inorganic), 4*s*. Vol. II. (Organic), 5*s*.

"These 'Notes' will, we believe, be found very useful for students, containing as they do exactly what is wanted, without being overloaded with any superfluous matter, and what is of no less importance in a constantly expanding science like chemistry, bringing up the information to the latest date and in accordance with the most advanced views of English and continental chemists."—*Educational Times*.

Helmholtz – Popular Lectures on Scientific subjects.

Memoirs of the Academy of Sciences of France. Gauthier-Villars

XLII. Vols.

Menlo Park Notebook #131 [N-80-07-00]

This notebook is undated but was probably used late in 1880. All of the entries are by Otto Moses. The first five pages contain a list by subject of the first fifty-five volumes of the Menlo Park Scrapbooks. (See Menlo Park Scrapbook Series.) On page 101 is a list of pamphlets relating to technical subjects. The label on the front cover is marked "Library Catalogue." The book contains 284 numbered pages.

Blank pages not filmed: 6-99, 102-284.

N0131

Edison's Laboratory Note books.

General subjects.

1. + Batteries
2. + Combustion of Coal.
3. + Conductivity and resistance of matter.
4. + Electrolysis
5. + Etheric Force
6. + Electrical testing.
7. + Electricity and Railways
8. + Electricity and Electricians, history of.
9. + Electric Pen.
10. + Electro-metallurgy.
11. + Electric Light.
12. + Induction
13. + Insulation
14. + Illuminating Gas I.
15. + " " II.
16. + Magnetism of steel bars.
17. + Magneto-electric Generators.
18. + Phenomena, general.
19. + Phonograph
20. + Polarization and secondary batteries.
21. + Telephones, carbon.
22. + " magnetic.

General subjects (continued)

23.+ Tasimeter
24.+ Thermo-electricity
25.+ Telegraph apparatus
26.+ " construction
27.× " submarine
28.× Telegraphy, automatic
29.× " fac-simile
30.× " duplex and quadruplex
31.× " fire alarm and burglar
32.× " not electrical
33.× The Laws of Electricity and Magnetism
34.+ Transmission of power.
35. Vaccuum Pumps and Radiometer
36 Motograph
36.+ Lightning protection & atmospheric
37.× Electricity
38.× Static Induction
39. Aerostatics
40.+ Electric machines in general.
41. Carbon.
42. General scrap book
43. Spectroscopy
44.+ General telegraphic matters.

Pamphlets

Report on the Cherokee Flat Blue Gravel & Spring Valley Mining & Irrig^n Co's Property.
Stretch, R. H., M.E. 1879. p. 16.

Summer Excursion Routes Penn. R. R. p. 166

Revue des Industries chimique & agricoles
Tome III., N° 34.

Observations on Mount Etna.
Reprint Am. Journ. Sci. July 1880
Langley S. P.

Menlo Park Notebook #132 [N-80-08-13]

This notebook covers the period August-December 1880. Most of the entries are by Francis Upton and Hermann Claudius. There are also a few entries by Edison. The material by Edison includes notes and drawings of electric meters. The material by Upton (who was assisted by another laboratory worker, possibly William Hammer) includes notes and calculations relating to lighting and power consumption in the Pearl Street district, based on statistics from the New York survey books. The material by Claudius also includes calculations, tables, and notes on lighting and power consumption in the first district, based on the survey books. An index to Claudius's entries appears on page 130. The label on the front cover is marked "Dist 1 N York. see volume labeled 'New-York City' By 'Districts' Index folio-130." Another label is marked "Meters" and "N.Y." The book contains 284 numbered pages.

Blank pages not filmed: 98-99, 118-123, 206-209, 236-239, 256-284.

DIST 1 N YORK.
see volume
labeled
"NEW-YORK, CITY"
BY
"DISTRICTS"
Index folio - 130

95

From the Laboratory
of
T. A. EDISON.
MENLO PARK, N. J.
No. 132

TAE Aug 13/1880

Use a Dynamo bobbin, in a shunt from the house circuit as we now use our ... cell

~~or new Comp... ... in which~~ ~~to glycerine~~ two or 3 gear wheels with a Revolving Chum filled with glycerine, a Regular Counter gives the Revolutions in a month, the Rev being proportional to the ...

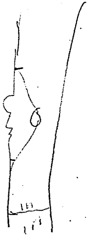
S1

T A E Aug 13/1880

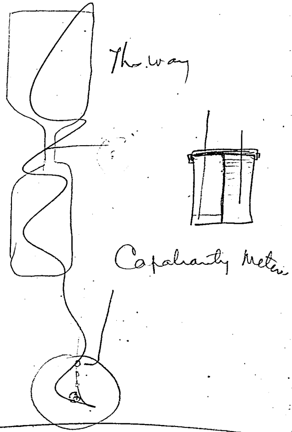
Use a Dynamo bobbin, in a
shunt from the house circuit as
we now use our Copper cell.
The field Magnet should be
large & multiple arc'd in the
mains, having such high Res
that it would give current
up to near saturation. The
Bobbin is connected by say ~~a~~
~~worm and wheel with a dash~~
~~[illegible] in which~~
~~[illegible]~~ two or 3 gear
wheels with a Revolving Chain
filled with glycerine. A Regular
Counter gives the Revolutions in a
month, the Res being proportional to the

Voltameter, in place rum
Copper Cell -

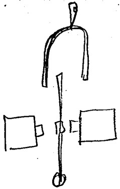
A Dynamo bobbin in place
of Dolbears axial magnet
& paper Drums an arm
from Dynamo bobbin has pencil
touching paper; a spring
prevents bobbin twisting around
more than 3/4 of a Revolution
work this up with a Counter.
If paper record is used. a Electric
Motor governed by a pendulum
could be used to give
motion to the paper to get
the timing

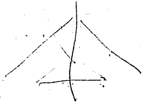


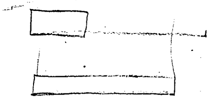
+ -



Water Meter - with a trip worked by a 3/4 turn Dynamo bobbin







~~Note~~ Having a 0''.008 X 0''.012 carbon giving 2 candles to find the size of one to give 12 candles in same circuit. or any number of candles

~~.~~017
~~.0~~08
~~.000~~136

~~.~~017
~~.00~~9
153

138 : 153 :: 1820 :

3.2601
2.1399
1.1202
2.1847

17
8
25

26

3.3049 — 2010

log 25 1.3979
comp 26 8.5850

3.2878 — 1940

1940

2.25 .3522
1.4150
8.1602 1
2.34 .3693

17
10
170

1.1202
2.2304
3.3506
1.3979
8.5686
2078 3.3171

3. .4771
8.6021
1.4314
3.24 .5106

17
11
17
17
187

1,1202
2.2718
3.3920
1,3979
8.5528
3.3427

2460
~~3.400~~

28

4

3.4

2200

0.5315
8.6021
1.4472
.5808

3.8

1.7
12
34
17
204

17
12
29

1.1202
2.3096
1.3979
8.5376
3.3653

1.1202
1.3979
2.5181

2310

4.1

0.6128
8.6021
0.4624
9.6773

47

14
17
98
14
238

31

2,5181
2.3766
8.5086
3.4033

2530

5.25 0,7202
8.6021
1.4914
.8137

6.5

16
17
112
16
272

16
17
33

2.5181
2.4346
8,4814
3.4341

27.20.

6.3 0.7993
8.6021
8.3 1.5185
.9199

18.
17
126
18
306

18
17
35

2. 5181
2. 4857
8 4559
3 4597

2850

7.7 0.8865
8.60 21
1.5441
10.7 1.6527

22
18
176
22
396

18
22
39

2.5181
2.5977
8.1 3979
3.5137

3260

12.2 1.0864
8.6021
1.6021
19.8 1.2906

~~97.5 1.9890~~ 96 1.9823

1.9890 1.9823

1.6464 1.6464

~~156 7.8069~~ 7.8027

2700 3.4313 3.4137

103 2.0128

2.0128

1.6464

156 7.8069

3010 3.4789

18 2.5181

20 2.5563

340 8.4202

3.4946 3120

9. 0.9542

8.6021

1.5798

1.1361 13.7

17 1.1202

20 2.5315

340 3.6517

4.5185

3.6517

.9668

9.3 per H.P.

4480

1.3979

8.4318

3.4814 3030

9 0.9542

8.6021

1.5682

1.1245 13.3

$$\begin{array}{r} 022 \\ 17 \\ \hline 154 \\ 22 \\ \hline 374 \end{array} \qquad \begin{array}{r} 1.1202 \\ 2.5729 \\ \hline .6931 \end{array}$$

None of these calculations are right for a lamp with increased cross section does not only takes as many times the ft. lbs. as its cross section is greater but more owing to the fact that it decreases its resistance

Standard Burner

0".012 X 0".012 X 6"

What will 0".017 X 0".017 X 6" give

$\frac{34}{24}$ times the light with same temperature

$\frac{34}{24}$ times the ft. lbs.

$$\begin{array}{r} 17 \\ \underline{17} \\ 139 \\ \underline{17} \\ 309 \end{array}$$

$\frac{144}{309}$ the resistance

$\sqrt{\frac{\frac{34}{24}}{\frac{144}{309}}}$ times the E.M.F

$$\frac{\mathcal{E}^2}{r} 44.3 = \text{ft lbs}$$

$$\mathcal{E}^2 = \frac{\text{ft. lbs} \times r}{44.3}$$

$$\mathcal{E} = \sqrt{\frac{\text{ft. lbs} \times r}{44.3}}$$

No. 1 Standard 0".012 × 0".012 × 6".
when cut

No 2 Other 0".00m × 0".00n × 6"
What candle power

Let a = candles from Standard
R = Ohms standard
$\mathcal{E}$ = E. m. f on standard

$$d = \frac{\mathcal{E}^2 \, 44.3}{R} = \text{ft. lbs on standard}$$

Same temperature [illegible]

$\frac{m+n}{24} a$ = candles from No. 2

$\frac{144}{mn} R$ = resistance No. 2

$\frac{m+n}{24} d$ = ft. lbs. of No. 2

$$\sqrt{\frac{\frac{m+n}{24} d \times \frac{144}{mn} R}{44.3}} = \text{E. M. F. No. 2}$$

$\frac{\mathcal{E}^2}{R} 44.3 = $ ft. lbs

$R = \frac{\mathcal{E}^2 \, 44.3}{\text{ft lbs.}}$

$$\begin{array}{r} 17 \\ \underline{17} \\ 139 \\ \underline{17} \\ 309 \end{array}$$

$$\begin{array}{r} 2.0128 \\ 2.0128 \\ 1.6469 \\ \underline{6.5086} \\ 2.1806 \end{array}$$

151.

$$\begin{array}{r} 1.5315 \\ \underline{1.3802} \\ .1513 \\ \underline{3.4914} \\ 3.6427 \\ 1.8490 \\ \underline{8.3536} \\ 3.8453 \\ 1.9226 \end{array}$$

$$\begin{array}{r} 2.1584 \\ 7.5100 \\ \underline{2.1806} \\ 1.8490 \end{array}$$

$a = 10$ candles
$d = 3100$ ft. lbs.
$\mathcal{E} = 103$ Volts
$R = 151$ Ohms
$m = 17 \; \frac{1}{1000}''$
$n = 17 \; \frac{1}{1000}''$

$\frac{m+n}{24} a = \frac{34}{24} 10 = 14.1$ candles

$\frac{144}{mn} R = \frac{144}{309} 151 = 70.6$ Ohms

$\frac{m+n}{24} d = \frac{34}{24} 3100 = 4390$ ft lbs

$\sqrt{\dfrac{\frac{m+n}{24} d \times \frac{144}{mn} R}{44.3}} = 83.6$ Volts

$d = \frac{\mathcal{E}^2}{R} 44.3$

$$a = f(d)$$

$$\frac{m+n}{24} f(d) = 15$$

$$\sqrt{\frac{\frac{m+n}{24} d \times \frac{144}{mn} f(d)}{44.3}} = 100$$

$R = \dfrac{\mathcal{E}^2\, 44.3}{ft.\ lbs}$

2.0233
2.0233
1.1646 4
6.4949
2.1877

154.5

2.1584
7.5884
$\bar{2}$.1889
1.9357

31
103
41.3

3.5872
1.9357
8.3536
3.8765
1.9382
1.9382
1.6464
8.0643
3.5891.

3.6163
1.9357
8.3536
3.9056
1.9528

$a = 12$ candles

$d = 3200$ ft lbs.

$\mathcal{E} = 105.5$

$R = 154.5$ ohms

$m = 17$

$n = 14$

17
14
68
17
258

17
14
31

$\dfrac{m+n}{24}\, a = \dfrac{31}{24}\, 12 = 15.5$ candles

$\dfrac{144}{m\,n}\, R = \dfrac{144}{258}\, 154.5 = 86.2$ ohms

$\dfrac{m+n}{24}\, d = \dfrac{31}{\cancel{24}_{3}}\ \cancel{3200}\ 400 = 4133$

$\sqrt{\dfrac{\dfrac{m+n}{24}\, d \times \dfrac{144}{m\,n}\, R}{44.3}} = 89.7$ volts

2.1584
7.6556
2.1875
2.0015

3275
814
4089

3.6116
2.0015
8.3536
3,9667
1,9833

$a = 13$
$d = 3275$
$\mathcal{E} = 166.7$
$R = 154$
$m = 17$
$n = 13$

17
13
51
17
221

$$\frac{m+n}{24} a = \frac{30}{24} 13 = \frac{5}{4} 13 = 16.25$$

$$\frac{144}{mn} R = \frac{144}{221} 154 = 100 \text{ Ohms}$$

$$\frac{m+n}{24} d = \frac{30}{24} 3275 = 4089$$

$$\sqrt{\frac{\frac{m+n}{24} a \times \frac{144}{mn} R}{44.3}} = 96.2$$

$a = \frac{48}{25} = 1.92$

2.1584
7.8665
2.2211

2.2460

1.3979
8.6198
3.2553

3.2730

2.2460
3.2730
8.3536

$\sqrt{3.8726}$
1.9363

$a = 1.92$ candles
$d = 1800$
$\varepsilon = 82.2$
$R = 166.4$
$m = 17$
$n = 8$

$\frac{17 \times 8}{136}$ $\frac{17 + 8}{25}$

$\frac{m+n}{24} a = \frac{25}{24} a = 2$

$\frac{144}{mn} R = \frac{144}{136} 166.4 = 176$

$\frac{m+n}{24} d = \frac{25}{24} 1800 = 1870$

$$\sqrt{\frac{\frac{m+n}{24} d \times \frac{144}{mn} R}{44.3}} = 86.4$$

$\frac{5}{6}a = 2$

$5a = 12$

$a = 2.4$

2.1584
8.0177
2.2172
2.3933

$\frac{5}{6}$ 2000

$\frac{5}{3}$ 1000

333
5
1666

3.2219
2.3933
8.3536
3.9788

4.5185
3.2219
1.2966

19.3 per H.P.
2
38.6 candles per H.P.

$a = 2.4$

$d = 2000$

$E = 85$

$R = 164.9$

$m = 12$

$n = 8$

$$\frac{m+n}{24}a = \frac{20}{24}a = 2$$

$$\frac{144}{mn}R = \frac{144}{96}R = 247$$

$$\frac{m+n}{24}d = \frac{20}{24}2000 = 1666$$

$$\sqrt{\frac{\frac{m+n}{24}d \times \frac{144}{mn}R}{44.3}} = 95.2 \text{ Volts}$$

2.1584
7.6904
2.1889
2.0377

29
~~4000~~
116 ~~00~~
3866

3.5872
2.0377
8.3536
3.9785
1.9892

1.9892
1.6464
7.9623
3.5871 3860

$a = 12$
$d = 3200$
$\mathcal{E} = 105.5$
$R = 154.5$
$m = 17$
$n = 12$

17
12
34
17
204
$m+n = 29$
$mn = 204$

$$\frac{m+n}{24} a = \frac{29}{24} 12 = 14.5$$

$$\frac{144}{mn} R = \frac{144}{204} 154.5 = 109.$$

$$\frac{m+n}{24} d = \frac{29}{\cancel{24}_{3}} \overset{400}{\cancel{3200}} = 3866$$

$$\sqrt{\underbrace{\frac{m+n}{24} a \times \frac{144}{mn} R}_{44.3}} = 97.6$$

21)48(2.28
42
60
42
180

2.1584
7.9666
2.2180
2.3430

1.3222
8.6198
3.2911
3.2331 1710
2.3430
8.3536
3.9297
1.9648

$a = 2.28$
$d = 1955$
$\mathcal{E} = 84.5$
$R = 165.2$
$m = 12$
$n = 9$

$$\begin{array}{r} 12 \\ 9 \\ \hline 108 \end{array}$$

$$\frac{m+n}{24} a = \frac{21}{24} a = 2$$

$$\frac{144}{mn} R = \frac{144}{108} 165.2 = 220$$

$$\frac{m+n}{24} d = \frac{21}{24} 1955 = 1710$$

$$\sqrt{\frac{\frac{m+n}{24} d \times \frac{144}{m} R}{44.3}} = 92.2 \text{ Volts}$$

11)24
2.18

16.54
12
3308
1654
19848

1.0414
8.9208
3.2733
3.2355
2.2984
8.3536
3.8875
1.9437

1.9227
1.9227
1.6464
7.7815
3.2733

4.5166
3.2355
1.2830

19.1 per H. P.

$a = 2.18$
$d = 1870$
$\mathcal{E} = 83.7$
$R = 165.4$
$m = 12$

$n = 10$

$$\frac{m+n}{24} a = \frac{22}{24} a = 2$$

$$\frac{144}{mn} R = \frac{144}{120} R = \frac{12}{10} 165.4 = 198.48$$

$$\frac{m+n}{24} d = \frac{22}{24} 1870 = 1720$$

$= 87.8$

2.0178
2.0178
1.6464
7.8097
3.4917

155
13.9

1.4771
8.6198
3.5886

2.1584
7.6556
2.1903
2.0043

2.0043
8.3536
3.9465
1.9232

$a = 11$

$d = 3100$

$\mathcal{E} = 104.2$

$R = 155$

$m = 17$

$n = 13$

$\begin{array}{r} 17 \\ 13 \\ \hline m+n \; 30 \end{array}$

$\begin{array}{r} 17 \\ 13 \\ \hline 51 \\ 17 \\ \hline mn = 221 \end{array}$

$\frac{m+n}{24} 11 = \frac{30}{24} 11 = \frac{5}{4} 11 = 13.7$

$\frac{144}{mn} 155 = \frac{144}{221} 155 = 101$ Ohms

$\frac{m+n}{24} d = \frac{30}{24} 3100 = 3888$

$\sqrt{}$ $= 84$ Volts

292.
24.3

(2500)
205
10

Book 1

2.00	4
4.00	4
24.30	80
25.	55
.60	2
30.	350
10	7
1.25	5
18.	6
30	5
4.	580
2	22
2	20.75
1	3.
12	7
3	12.50
3	200
1.25	7
1.00	1.25
150	75
140	2.
4.	3.50
3.50	2.
3	6
3.50	1.
200	1.
4	1.
18	2.50
20	.75
2	3.50
30	6.
237.60	490.80

40
60
80
50
30
80
30
80
100
100
150
100

900

25

900
30

900

27,000
.25

135
54

675.000

23760
490.80
345.50
268.75

2.25) 1342.65 (596
1350
1125
2176
2025
1515
1355
160

150

596

Book 1

25
3
8
8
2
4
4
4
3
4
4
1.50
6
1
7
2
8
200
2.50
5.
1
1.50
2.50
10
1.
2.
11
1.50
2
1

345.50

3.50
75
4
3
2.50
11
50
1.50
.50
12
1
20
8
9
1
1.50
6
1.50
15
75
25
9
4
4

268.75

5 P.M
4 P.M 5
4 5
5
5
5
5

6-30

Book 1 closing hours

6 6
6 5 30 7
7 P.M
6 6 6. 5 30 7 12 P.M
6 6 6 5 30 7 12
6 6 6 5 30 7
6 6 . 6 5 30
6 6 6 5 30 7
6 6 6 5 30
6 6 5 30
6 6 666 5 30 8 P.M
6 6 666 5 30
6 6 666 5 30 8.
6 6 666 5 30
6 6 666 5 30
6 6 666
6 6 666 10 P.M
6 6 666 10
6 6 666
6 6 666 All night
6 6 666
6 6 666
6 6 666
6 6 666
6 6 666
6 6 666 9
6 6 666 9
6 6 66
6 6 66

12
6
3
1
5
5
6
$ 38
150
6.
145.50

18
17
35

4.5
4.

104

2

45
27.5
2) 45

Book 1
Powers used

6
1
$2000.
1
6
5
2
2
2
20

$12 a week
$18 a month
$6 a week
$3 a week
$1.50
$1 a week
3 cts
3 cts
17 a month
$104 a year
$312 a year

.33
2.5
5.
3.
14.
7.5
9.
5
9.
5
12
1.0
20

102.33
7

109. H.P.

Two hand presses
Two mach—
2 —
6
1
2
2
1
1
2
1
3
1
1
1
1
1
2
2

34

Book 1 Power used

— $5.00 a week
— 5.00 a week
— 300 a year —

10
3 — 1 tons coal per month
— Horse for hoisting
2 Boston engines
2 tons per month

1
— $6.00 a week
3.5 Ton per month
Calcium
3.5 Calcium
1½ ton per mo
4.5 Calcium

27.5 1 ton per month

Book 1 Power used

— Use horse —

.5 $1.00 per week

.5 $1.00 per week

.5 For hunting

.5

Engine 1 ton a week

2.

Book 1 maximum burners

6
100 to six
50 but 430 & 5
8
3 all night
45
15
20
2
1
6
2
4
1
1
2
3
2
2
2
6
4

275

	20	5
	~~8~~	25
	9	6
	1	8
	22	12
	6	25
	12	9
	20	1
	5	1
	6	12
	4	8
	2	6
	6	2
	1	2
	1	2
	4	4
	129	1
		4
		4
		20
		157

365
25
1815
730
9115

30/596,000

938

250
127
157
129
275
938

Book 1 Maximum burners

4	4
4	6
7	4
2	12
2	25
10	1
	1
60	12
3	1
2	20
1	16
2	20
4	2
6	20
1	6
2	2
6	8
2	30
2	16
1	20
	12
4	6
1	6
127	250

average Rank 1

596,000	5.7752
938	2.9722
	2.8030

~~635~~
635 feet per month

2.8030
1.4150
1.3880

24.4 feet per day

26 days of five hour

Boots 1 Las companies Mutual

NY

29

77

35 Mutual
77 New York
110

770
500
406
324
340
2340
496
64
7
2907

272
181
43
496

Shades

4
12
2
6
20
5
10
5
64

Well

80
4
12
25
20
25
30
8
40
70
10
324

50
200
20
60
4
6
340

89

2
8
2
4
3
6
12
2
4
43

Without

15
150
30
50
8
50
45
8
3
2
5
1
2
2
1
8
16
30
6
25
118
5
20
90
18
12
50
770

Book | Fixtures

12
8
2
6
1
~~2~~
1
1
6
27
10
150
12
1
22
37
25
12
8
20
10
20
10
7
60
10
12
500

6
10
3
5
8
12
30
105
20
10
9
10
20
3
12
40
6
10
9
9
4
8
12
20
25
406

Clear

4
2
1
2
7

6
4
6
4
6
2
12
40
9
2
8
2
6
40
2
1
4
8
4
12
3
181

g.g.

100
4
20
7
3
4
2
12
4
6
16
9
3
14
8
8
14
40
2
8
2
6
272

Book
Have noticed leakage

Yes	Do not know	no
	1	
99		
5		

Bark !
Use gas for heating

Bothered (Book) with heat

Yes,	Don't know.	No.
~~||||~~		~~||||~~
~~||||~~		~~||||~~
~~||||~~		10 ~~||||~~
~~||||~~ 20		20 ~~||||~~
~~||||~~		~~||||~~
~~||||~~ 30		~~||||~~
~~||||~~		30 ~~||||~~
~~||||~~ 40		|||
~~||||~~		
~~||||~~ 50		
~~||||~~		
~~||||~~ 60		
~~||||~~		
||		

$$\begin{array}{r} 38 \\ 67 \\ \hline 105 \end{array}$$

Dagroin Book 11 jets

Yess

No

||

105 yes
2 no

Book 1 Stave to regulate

~~||||~~ ~~||||~~

~~||||~~ ~~||||~~

~~||||~~ ~~||||~~

~~||||~~ ~~||||~~

~~||||~~ ~~||||~~

~~||||~~ ~~||||~~

~~||||~~ ||||

~~||||~~ 104

~~||||~~

~~||||~~

~~||||~~

~~||||~~

~~||||~~

~~||||~~ 71

Like gas Barton 1

Yes

No

$$\begin{array}{r} 85 \\ 25 \\ \hline 110 \end{array}$$

1/5	1/4
8	21

Ventilation Book 1

Fair	Yes	Not Entered	No
5	18	1	16

Insurance Book 1

1/2	3/4	1	1 1/4	1 1/2	Don't know	No
37	32	14	12	8	2	21

Ventilation Book 1

Yes	Fair	Not Ex Iran	No
40	11	1	111
50	70		20
60	75		

23
75
7
106

beyond curb 5

1 11

middle street Zoo Vault

~~||||~~ 1

1

Book 1

Width sidewalk

Anyone [?] vault extend towards

Even curb 10 feet 8 9

~~||||~~ 1 ~~||||~~ 11

~~||||~~ ~~||||~~

~~||||~~ ~~||||~~ ~~||||~~

~~||||~~ ~~||||~~ ||||

~~||||~~ ~~||||~~ 19

~~||||~~ ~~||||~~

~~||||~~ ~~||||~~

~~||||~~ |||

~~||||~~ 98

~~||||~~

~~||||~~

~~||||~~

~~||||~~

~~||||~~

~~||||~~

Day time

2	1	12
8	2	3
6	25	2
2	8	2
2	1	4
2	4	7
2	4	8
1	2	10
2	2	6
2	2	8
2	6	62
2	4	102
6	2	106
2	2	270
20	1	5
8	10	
22	4	
1	1	
3	1	
1	2	
2	3	
2	1	
5	1	
1	2	
	2	
	9	
106	102	

Book 1

Consumers   Non Consum

111

113

20

40

60

80

2

40

50

60

60

70

80

90

88
113
201

Burtal

536
10
205
100
———
851

286
20
160

Lamp 100 Volts

10 Ohms Motor

90 contrary Volts
10 active Volts

$\frac{10}{10}$ 1 Weber

90	10
1
900	4400 ft. lbs.
44
396
440	100
4400	100
	100 | 4400

Book 2

Book #4

Bills for one year — $183.50

i.e. – per month $15.29

Bills per month 58.15

17.00

Bills per week 4.05 230.90

321.34

Bills – Jan June

99.45 56.99 per month 47.10

60.40 32.83 per month 50.30

74.06 38.07 418.74

233.91 127.89

127.89

461.80

230.90

Book 2 →

659 burners

$321.~~34~~

2.25

2.5065
0.35??
2.1543

142000

65.9
26
5

2.X159
1.4150
.6990
4.9329

85700

5.1543
4.9329
.2214

1.6 hours per day

Book #3

Jan.	July.	Mon.	Year.
2.92	.25	2.00	
17.25	8.10	12.00	
5.50	1.55	1.50	
2.40	1.35	50.00	
6.75	68	2.25	
6.00	2.70	1.12	
4.50	.50	4.00	
4.50	.50	6.00	
3.25	.75	~~8.10~~	
4.00	2.00	~~17.25~~	
3.00	2.00	1.50	
9.00		2.00	
69.07	20.35	3.00	
		3.00	
		2.50	
		1.00	
		1.00	
		.62	
		1.50	
		3.50	
		4.50	
		8.00	
		1.50	
		139.49	

810
1225
2035

139.84
20.35
119.49

Book ~~RH~~ 3

Jan	July	Mm	Jean
4.50	.45	200	
4.50	.10	1.00	
4.00	.30	3.00	
2.00	.38	2.00	
6.75	2.50	4.50	
7.00	.35	4.50	
4.75	.10	5.00	
33.50	4.18	1.00	
		2.25	
		2.75	
		2.75	
		2.75	
		2.75	
		2.75	
		275	
		275	
		275	
		275	
		275	
		275	
		275	
		275	
		275	
		275	
		275	
		69.75	

Book # 3

Jan	July	Nov	Year
4.00	2.00	100.00	
150.00	25.00	8.00	
2.00	.45	2.00	
4.00	1.35	.25	
14.00	1.20	15.00	
9.00	3.60	180.00	
7.00	.45	1.10	
16.50	1.60	1.25	
100.00	69.00	11.00	
		1.00	
306.50	104.65	4.00	
		1.50	
		2.50	
		1.00	
		15.00	
		2.00	
		20.00	
		2.00	
		15.00	
		21.00	
		7.50	
		5.00	
		416.10	

305
695
$ 1000

695.94
20.35
$ 675.59
305.34
980.93

37 Jan Bills
36 July Bills.

Book #3

Jan	July	Mon	Year	Totals	
6.00	2.25	15.00		69.07	20.35
3.00	.68	2.50		33.50	4.18
10.00	3.50	4.00		306.50	104.65
5.00	2.00	2.00		54.25	19.83
3.75	.90	1.50		462.32	149.01
7.00	2.00	2.00		149.01	
12.00	5.00	2.00		2 | 611.33	
1.50	.50	.75		305.66.	
6.00	3.00	1.50		for months of Jan + Dec.	
54.25	19.83	5.00			
		.50			
		25.00			
		8.00			
		1.00			
		4.50			
		70.25			

119.49
69.75
416.10
70.25
$ 675.59

Total for months

Average in Jan $ 12.49
" " July $ 4.12

Book 8

3	12	40	3
2	2	75	6
5	2	2	8
2	1	4	3
26	3	1	6
3	5	3	4
3	2	2	10
6	4	6	20
1	4	2	10
15	4	22	4
15	4	3	6
3	1	3	8
2	2	5	88
6	104	8	
3	5	6	
1	8	24	
1	1	12	
2	3	6	
4	5	2	
4	6	11	
7	3	20	
5	8	5	
8	8	5	
3	372	4	
3	16	5	
3	6	8	
6	7	9	
7	14	6	
150	4	6	
	616	2	
		5	
		311	

1165

maximum no. burners bet. 5 & 6 P.M.

Book 3

1 – 1 Hoist –	25 Horsepower		Grind Stone	Sewing Machine
1 – 1 "	10 "	"	1	1
1 – 1 "	$1\frac{1}{2}$ "	"		
1 – 1 "	one one		1	1
1 – 1 "	3/4 "	"		
1 – 1 "				
1 – 1 "				
1 – 1 "				

37 1/4 H. P

32 Hoists

40 H.P

Book 3

Do you use an engine, If so whose make is it.

Yes — Smith Bros & Co about 40

Todd & Rafferty: 15 H.P.
Todd & Rafferty: 30 H.P.
Boyden. 25 H.P.
Copeland, 20 H.P.
1 caloric engine 2 H.P.

How much coal do you use per day, week or month for power.

3 Tons per week — 7
10 " " month — 7
6 " " " — 1/4
3 1/2 " " week = 2
2 " " " — 3 1/2
1 " " month — 24
1 " " day — 40
1 " " " — 3

86 3/4 per week

Do you have a specially employed engineer or what proportion of the time does he spend on the engine.

Yes 5 ~~1111~~ 2 — 1/5 of time on engine
makes himself generally useful.

7 specially — bridge tender attends to it

Book 3

Do you rent power? If so how much do you pay per year for the whole or per Horse power?

Yes	No.
1	190
84.00 per year	
1	
1	
4 yes.	

How many H. P. do they charge you for

1 1/2	40
1	
15	
20	
2	

How much do you think you use

1/2	40
3/4	
10	
25	
20	
2	

Book 3

Do you use the power all the time, If not what proportion.

Yes

all in cold weather.

Have you any machinery driven by foot power

Yes

1 sewing machine
1 grind stone
1 sewing machine
1 —

no

109

Book 4.

Jan.	July	Month.		~~Month~~
13.00	6.00	3.00	5.00	3.50
3.00	.25	1.00	5.00	2.00
3.50	2.70	5.00	6.00	2.00
10.00	5.00	5.30	9.00	10.00
20.00	7.65	4.00	1.00	1.00
93.	30.	20.00	5.00	1.50
7.35	.68	10.00	5.00	3.00
11.00	1.00	1.00	.40	9.00
4.25	.45	4.50	3.00	1.00
3.00	.43	5.00	15.00	3.00
13.00	1.50	4.00	40.00	1.00
27.00	9.00	1.00	4.00	5.00
13.00	4.00	2.00	8.00	5.00
6.00	3.15	1.00	2.00	.75
5.00	3.50	2.00	10.00	5.00
5.00	1.00	5.00	15.00	20.00
5.00	2.00	1.00	3.00	5.00
3.00	.23	30.00	9.00	3.00
		40.00	2.00	4.50
		10.00	2.25	50.00
		5.00	15.00	4.00
		5.00	3.00	7.50
		40.00	8.00	20.00
		4.00	4.00	3.00
		3.50	1.00	1.00
		12.00	13.00	1.00
		2.00	18.00	
			6.00	
245.10	78.56	226.50	217.65	121.75
Jan.	July			

Book 4

Jan	July	Month	Year
12.00	8.78	1.50	
3.00	1.46	2.50	
		50.00	
	10.24	9.00	
15.00		50.00	
245.10	78.56	3.50	
260.10	88.80	1.00	
Jan Total.	July Total.	.75	
		3.00	
		200.00	
		13.00	
		13.00	
		12.00	
		12.00	
		4.00	
		5.00	
		380.25	
		~~226.50~~	
		217.65	
		121.75	
		946.15	
		Total of Month average	

260.10 Jan
88.80 July
2/348.90
174.45

946.15
174.45
1120.60

Book 4

No of burners				
9	25	12	5	50
10	8	12	5	12
14	4	3	10	6
10	12	5	48	5
15	12	6	3	2
8	22	4	1	5
25	6	15	4	6
9	8	15	7	350
8	12	26	3	8
6	6	12	10	10
15	6	50	60	5
25	10	6	1	9
4	35	7	20	6
14	15	6	6	10
10	25	6	8	484
4	2	15	6	
3	4	12	40	
4	15	3	3	
20	1	10	12	
9	8	2	3	
12	40	8	4	
6	10	9	7	
3	20	6	12	
30	6	10	18	
25	25	20	14	
8	6	6	310	
25	13	12		
25	33	12		
35				
40				
431	389	310		

484
310
310
389
431
1824

Total burners.

Index

1). Extract of one house in Book 3.

			x
Jan.	1291	cubic feetgas per 1 burner =	16,7706 % –
Feb.	671	" . . . . . =	8,7165 " –
March	630	" " . . . . =	8,1839 " –
Apr.	641	" . . . . . =	8,3269 " –
May	603	" " . . . . =	7,8332 " –
June	482	" " . . . . =	6,2613 " –
July	323	" " . . . . =	4,1959 " –
Aug.	196	" " . . . . =	2,5461 "
Sept.	357	" " . . . . =	4,6376 " –
Oct.	605	. . . . . . =	7,8592 –
Nov.	555	. . . . . . =	7,2097 –
Dec.	1344	. . . . . =	17,4591
S.ᵃ	7698 = 100 %	S.ᵃ	100,0000 %

$$\frac{7698 : 1291 = 100 : x}{x = 16,770\ \%} \text{ etc.}$$

x is the Model for the month. (in this house very good notices)

log. 16,7706 = 1,2245483
" 8,7165 = 0,9403446
" 8,1839 = 0,9129626
" 8,3269 = 0,9204801
" 7,8332 = 0,8939394
" 6,2613 = 0,7966691
" 4,1959 = 0,6228246
" 2,5461 = 0,4058782
" 4,6376 = 0,6662903
" 7,8592 = 0,8953775
" 7,2097 = 0,8579151
" 17,4591 = 1,2420214

The following numbers are quotients of the consumed gas divided by the number of burners (5-6 b). Comparatively few notices of consumed gas are used, but these, who appeared to be reasonables.

January.

214
308
1000
466
262
545
483
620
330
275
630
190
900
375
262

S=6598 / 14 = 12,2948 %

February.

214
233
592
262
275
533
390
155
876
580
457
550
200
215
~~560~~
S: 5532 = 10,3084 %
/14

March

214
192
133
266
607
33
350
165
1000
560
528
186
200
210

S^{c} 4644 = 8,6537 %

14

April

214
166
425
133
290
180
183
200
443
53
37
290
145
466
235

S. 3155 = 5,8791 %

/14

May

214
191
520
583
133
100
83
416
100
83
66
429
480
33

$\frac{3431}{14} = 6{,}3934\ \%$

June.

71
508
300
133
100
121
83
400
140
216
83
66
214
33

Sa 2468 = 4,5989 %

/4

July

71
220
408
475
250
311
133
100
165
83
516
140
120
83

Se 3075 = 5,7300 %

1/4

[ITEM FOUND IN BOOK]

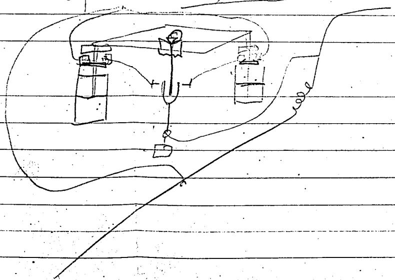
McGowan

Patent Incandescent system
of Central station
Conductors

see abt = do
Chlorine Compounds in Lamp
anhydrous. pentchloride

float Meter like 248 565-

Nitrated Cellulose paper punching
out submitting to Vapor alcohol & Ether
or other Solvent Either under pressure
or not, Carbzg — fibres also



August

71.
340
455
133
416
800
183
366
110
416
466
480
57
102

S^a 4345 = 8,0965 %
/14

September

71
161
125
400
400
104
158
232
252
667
33
83
390
136

S 3212 = 5,9853 %

/14

October

214
566
300
161
165
566
566
350
100
100
350
566
566
165

These numbers are the last 5 numbers above, for there were but very few notices, concerning the month of October.

$$\text{fc } 4735 \div 14 = 8{,}8232\%$$

November.

214
266
800
161
195
733
760
171
100
471
471
100
171
760 } the same thing, like in the months of October.

$$\text{£}\ \frac{5373}{12} = 10,0121.9$$

December

214
743
583
800
466
404
416
433
560
460
366
366
686
600

$7097 = 13,2246$

/14

Summary

Jan:	6598 =	lg: 1,0897212 =	12,2948 %
Feb:	5532 =	" 1,0131911 =	10,3084 "
Ma:	4644 =	" 0,9372011 =	8,6537 "
Apr.	3155 =	" 0,7693083 =	5,8791 "
May	3431 =	" 0,8057296 =	6,3954 +
June	2468 =	" 0,6623541 =	4,5989
July	3075 =	" 0,7581540 =	5,7300
Aug.	4345 =	" 0,9082987 =	8,0965
Sept.	3212 =	" 0,7770844 =	5,9853 "
Oct.	4735 =	" 0,9456289 =	8,8232
Nov.	5373 =	" 1,0005257 =	10,0121
Dec.	7097 =	" 1,1213837 =	13,2246
Sa	53665 = 100%		Sa 100,0000%

$\frac{53665}{14}$

53665 : 6598 = 100 : x

x = 12,2948%

The division by 14 (the number of postes) is not executed, ~~while~~ not necessary.

Extract of an other house in Book 3,
January was not notified and therefore
I have taken the number of December
for this month.

Jan:	1065 =	1,0913891 =	12,3421 %
Feb:	837 =	0,9867650 =	9,6099 " ±
March	726 =	0,9249761 =	8,4135 "
April	640 =	0,8702195 =	7,4168 "
May	509 =	0,7707573 =	5,8987 "
June	497 =	0,7603959 =	5,7596 "
July	485 =	0,7497812 =	5,6206 "
Aug	506 =	0,7681900 =	5,8640 "
Sept	634 =	0,8661288 =	7,3473 "
Oct	771 =	0,9510939 =	8,9350 "
Nov	894 =	1,0153770 =	10,3604 "
Decb:	1065 =	1,0913891 =	12,3421 "
S =	8629 = 100 %		S = 100,0000 %

8629 : 1065 = 100 : x

x =

Recapitulation of Per Cents :

Month	House of Boats 3, very clear	Dito, but the month of Jan. was not entered.	Average of 14 Notices.	Average
Jan	16,7706	12,2948	12,3421	13,8025
Feb	8,7165	10,3084	9,6999	9,5749
Mar	8,1839	8,6537	8,4135	8,4170
Apr	8,3269	5,8791	7,4168	7,2076
May	7,8332	6,3934	5,8987	6,7084
June	6,2613	4,5989	5,7596	5,5399
July	4,1959	5,7300	5,6206	5,1822
Aug	2,5461	8,0965	5,8640	5,5022
Sept	4,6376	5,9853	7,3473	5,9901
Oct	7,8592	8,8232	8,9350	8,5392
Nov	7,2097	10,0121	10,3604	9,1941
Dec	17,4591	13,2246	12,3421	14,3419
	100,0000	100,0000	100,0000	100,0000

The Per Cents of the column „Average" will be the „modul" for the calculation of consume of gas per house, if but few monthes are notified.

Logarithmens of the "moduluс"

13,8025	January	= 1,1399578
9,5749	February	= 0,9811342
8,4170	March	= 0,9251573
7,2076	April	= 0,8577907
6,7084	May	= 0,8266190
5,5399	June	= 0,7435019
5,1822	July	= 0,7145142
5,5022	August	= 0,7405364
5,9901	Sept.	= 0,7774341
8,5392	Oct.	= 0,9314172
9,1941	Novb.	= 0,9635092
14,3419	Decbr	= 1,1566067

The "modulus" of any month is used, as follows:

There shall be calculated the amount of consumed gas for year by the only notice of the month of July, = 250 cubicfeet.

The "modulus" for July: 5,1822 %

$$5,1822 : 100 = 250 : x$$

$$x = 4824,2 \text{ cubicfeet a year.}$$

The Percents not:

Jan:	14 %	Transf.	52 %
Febr:	10 "	July	5 "
March:	8 "	Aug.	5 "
Apr:	7 "	Sept	6 "
May	7 "	Oct.	9 "
June	6 "	Nov.	9 "
		Decb.	14 "
Transf.	52 %	S^a	100 %

How I found the key for the calculation of the average consume of gas per year.

1.) I divided several hunderts of notices, month by month, by the number of burners and entered these units on a table, containing the months, eliminating unreasonable numbers.
2.) In this manner calculating several books, I found in book 3 a house, where every month seemed to be entered very reasonable and correct, (not only by the clerc himself, but of course of good informations received).
In the same book I found an other house, entered in the same

manner, but the month of January was missing. I supposed this month would have the amount of the month of December and supplied him in this manner.

3.) How I was able, to make the 3 calculations on page 131, 133 – 157 and 159.

The Recapitulation is to be seen on page 161 and the last column of this table contains the average amount of percents, which belong to every month, whole the year = 100 %

4. Page 163 shows, how the percents are arrounded and now it is very easy, to calculate whatever an average amount of consumed gas per year by only one month's notice. Viz:

Notice of February 1000 cub.f.

$$10\% : 100\% = 1000 : x$$

$$x = 10000 \text{ cubfeet}$$

Menlo Park, Hermann Claudius
24. Decbr. 1880.

Mutual Gas Co. per 1000 cubfeet 2 $ 25 c.
New-York " " " " " 2 " 25 "

5 Cub. fr. p. Stunde = 15 Kerze

1 Strom.

1 Streetlamp = 4000 hours per year.) calcul: with 12 h

2)

Street	Nr.	per Year Cub: Feet	Cub. f. p. Day	[illegible]	p. head and day
Spruce street	2.4.6	14000		6	
	8	162000		70	
	10	132000		30	
	12.14	159000		8	
	16	60000		4	
	18	252000		60	
	20	24000		50	
	22	11000		2	
Corner Spruce and William		16000		1	
		830000	2274	231	(9)
William street	179	64000		6	
	177	32000		6	
	175	7000		1	
	173	13000		3	
	171	7000		2	
cor: William and Beekman		21000		3	
		144000	394	21	18
Beekman street	36	19000		2	
	34	16000		2	
	32	40000		8	
	30	117000		47	
	28	118000		33	
	24	466000		64	
	20	293000		31	
	18	11000		5	
	16	19000		6	
	14	37000		4	
	12	27000		2	
	10	32000		6	
corner B. and [illegible]		~~27000~~		1	
do.		138000		2	
		1333000	3652	211	17

Street	Nr.	per Year Cub: Feet	cub feet p. Day	[illegible]	p. head and day
Nassau street	138	4000		1	
	140	27000		4	
	142	117000		5	
	144	15000		6	
	146	37000		8	
	148-152	1.177000		63	
		1372000	3759	87	43
Spruce street		~~7000~~		~~2~~	
	26	11000		2	
	28-30	11000		4	
	32	19000		14	
	34	64000		20	
	36	37000		8	
	38	10000		4	
	40	17000		5	
Spruce cor. Gold st.		19000		4	
		188000	516	61	8
Gold street	67	32000		4	
Corner of [illegible]		133000		20	
		165000	453	24	19
Beekman street	56	16000		4	
	54	95000		15	
	52	10000		3	
	46	53000		2	
	44	53000		12	
cor. Beekman and William		1067000	3545	58	
		1294000	~~453~~	94	

Str	No	Per Year Cubic feet	Cub feet per day	Burner	per burner and day
W. Waterstreet (Block 20)	172	13000		3	
	174	27000		2	
	176	28000		7	
	178	54000		6	
	180	16000		3	
		136000	372	21	18
Corner Ferry & Gold		58000		6	
Ferry st. (Block 25)	6	8000		2	
	8	11000		2	
	12	5000		1	
	26-28	19000		4	
	30	4000		1	
	38	21000		4	
		126000	345	20	17
Cliff st.	67	16000		6	
	65	13000		4	
	2	58000		12	
		87000	238	22	11
Beekmanstr.	88/90	267000		36	
	86	11000		2	
	82/84	279000		112	
	80	40000		8	
	76	80000		8	
	74	400000		88	
	72	58000		16	
	70	134000		12	
	68	48000		12	
	66	42000		12	
Cor. Beek. and Gold		37000		7	
		1396000	3824	312	12

Str	No	Per Year Cubic feet	Cubfeet per day	Burner	per burner and day
Gold st. (Block 25)	72	27000		2	
	74	2000			
	80	13000		3	
	82				
		42000	115	3	
Corner Cliff & Ferry Str.		27000			
		27000	74		
Ferry st. (Block 28)	50	2000		1	
		2000	5	1	
Corn. Ferry and Pearl Str		120000		15	
		120000	329	15	22
Pearl st.	307	36000		5	
	305	21000			
	301	71000		12	
	299	31000		2	
	293	20000		4	
	291	41000		8	
Cor. 289 Pearl and Beekm.		222000		20	
		422000	1156	51	22
Beekman st.	96	40000		8	
	94	48000		8	
	92	85000		12	
Corner Beekman and Cliff		27000			
		200000	548	28	
Cliff st. (Block 26)	66	4000		1	
	68	13000			
	70	69000		9	
		86000	235	10	

Str	No	Per Year Cubicfeet	Cub f. p. Day	Burner	p. burner and day
Dock Slip (Block 35)	10	6000			Dispute with Mr. Clark and rejected license not after burning
		6000	16		
Cor. Dock and Water		9000		5	
		9000	22	5	4
Waterstr.	256	27000		7	
	254	8000		4	
	252	3000		1	
	248	10000		3	
	246	11000		4	
	244	12000		4	
	242	3000		8	
	240	5000		7	
	238	5000		6	
	236	59000		24	
	234/32	54000		35	
Cor. Beekm. Waterstr.		78000		20	
		275000	753	123	6
Beekmanstr.	110-116	42000		10	
	106/8	2000			
		44000	121		
Corner Beekm. and Pearlstr.		48000		9	
Pearlstreet	292	10000		6	
	294	43000		13	
	296	65000		28	
	302	73000		12	
	304	64000		4	
	Tr.:	255000			
		9000			
		Total			

Str	No.	Per Year Cubicfeet	Cub feet per day	per Burner	per burner and day
Pearlstreet (Block 35)	308	20000		3	
	310	38000		10	
	300	54000		14	
		367000	1005	99	10
C. Waterstr. and Dockslip		16000		6	
Dock slip (Block 43)	22	27000		8	
		43000	122	14	8
Cor. Frontstr. and Dockslip		5000		2	
		5000	14	2	7
Frontstreet	228/30	113000		6	
	232/34	3000		2	
	226	8000		6	
	224	11000		4	
	222	3000		3	
	220	44000		7	
	218	5000		3	
	216	4000		1	
	214	11000		2	
Cor. Beekman and Frontstr.		34000		14	
		236000	646	48	13
Beekmanstr.	126	4000		2	
	124	21000		4	
Corner Beekman and Waterstreet		80000		15	
		105000	288	21	14
Waterstreet	233	13000		3	
	235	1000		1	
	237	16000		6	
	Tr.	30000		10	

Str	Nr	Per Year Cubic feet	Cubfeet p. Day	Burners	p. burner and Day
Waterstreet, Block 43	239/41	60000		10	
	245/47	42000		2	
	249	5000		3	
		137000	348	23	
Corn: Frontst. and Peckslip, Block 43		14000		4	
		14000	38	4	9
Peckslip	40	37000		5	
Corn: Peckslip and Southstr., Block 51		233000		12	
		270000	739	17	43
Southstr.	116	21000		8	
	114/115	16000		4	
	113	53000		6	
	112	32000		5	
	111	64000		8	
	110	48000		7	
	109	58000		8	
	108	80000		8	
	105	260000		10	
Corn: South and Beekman		202000		17	
		1244000	3408	81	42
Corner Front and Beekmanstr.		27000		8	
		27000		8	

Str	Nr	Per Year Cubicfeet	Cubfeet p. Day	Burners	p. burner and Day
Front street	225	20000		8	
	229/31	58000		7	
		105000	287	23	12
~~Corn: South~~ Corner South and Beekm., Block 51		87000		12	
		87000	238	12	~~238~~ 19
Corn: Beekmanstr. Fulton market		104000 ~~57000~~		24 ~~29~~	
		104000	285	24	12
Beekm: Front. Fultonmarket		59000 ~~48000~~		11 ~~4~~	
		59000	162	11	15
Corn: Fult. Mc. — Front str.		152000 ~~93000~~		24 ~~13~~	
		152000	403	24	17
Block 50, Board 2: Corn: Fultonstr. — Fult. Mc.		246000		35	
		246000	674	35	19
Corn: Fult: South — Fult. Mc.		194000 ~~187000~~		10 ~~7~~	
		194000	531	10	53
Corn: Southstr. — Fult. Mc.		374000 ~~43000~~		37½ ~~6~~	
		374000	1024	37½	4
Fulton Mc.	88/89	240000		26	
		240000	657	26	25
Outside Stand Southstr. — Fult. Mc.		61000		13	
		61000	167	13	13

Str	Nr	Per Year Cubicfeet	Cubfeet p. Day	Burners	p. burner and Day
Outside Stand Fulton and South str. — Fulton Mc.		21000		6	
		21000	57	6	9
Outside Stand Fulton Mc. — Fulton str.		32000		1	
		32000	87	1	87
Beekm: Str.		16000		15	
		16000	44	15	3
Frontstr.		32000		4	
		32000	88	4	22
Block 50: Front str. and Fulton str. — Fulton Market		22000		14	
		22000	60	14	4
Fulton Market	241	29000		3	
	212	13000		1	
	214/216	8000		2	
	220	20000		6	
	236	20000		3	
	233	25000		1	
	231	25000		1	
	222	11000		2	
	224/226	~~13000~~ 20000		3	
	194/195	37000		4	
		~~208000~~ 221000		~~26~~ 30	

Str	No	Per Year Cubicfeet	Cubfeet p. Day	Burners	p. burner and Day
Fulton Market	163/65	21 30000		30 7	
	111, 112, 113, 120, 121, 122, 123	48000		5	
	125, 126, 127	85000		8	
	152/53	16000		2	
	166/67	8000		3	
	161/62	14000		3	
	137/60	11000		3	
	98/100	19000		6	
	95/97	21000		7	
	117/18	16000		2	
	146/48	4000		[illegible]	
Block 50	172	16000		2	
	176	11000		1	
	150/51	22000		3	
	177/78	3000		5	
	182/83	14000		2	
	184/5	24000		4	
	202/203	24000		4	
	198/201	22000		4	
	188/189	5000		1	
	196/97	24000		2	
Corn: Fult. St. South street		264000		51	
South side Oppos: Fult. Mc.		431000		56	
Foot of Fult. St. East River		825000		104	
Corn: Beekman point		5000		5	
		2175000	5959	316	19
Beekmanstr., Block 42	123	48000		8	
		48000			

1	2	3	4	5	6
Beekmanstreet	119	48000		8	
		11000		3	
Corn. Beekm. St. = Waterstr.	127	13000		6	
		72000	197	17	11
Waterstreet	217	1000		3	
	213/215	80000		8	
	211	71000		8	
205/209 Water 21 Fulton 202/4 Frontstreet		960000		372	
		1112000	3046	391	8
Corn. Water & Fultonstr.		31000		16	
Fultonstr.	23	12000		6	
	19	26000		18	
	17	83000		40	
		152000	416	80	5
Corner Front & Fultonstr.		88000		75	
Frontstr. Block 42	203	5000		23	
	205	21000		4	
		114000	311	81	4

1	2	3	4	5	6
Corn. Water & Beekm. Str.		8000		3	
Beekmanstr. Block 34	117	13000		6	
	115	5000		2	
Corn. 109 Beekm. 242 Pearlstr.		183000		22	
Beekmanstr.	105	13000		3	
Corn. Beekm. & Pearlstr.		150000		3	
		302000	827	39	21
Pearlstreet	280	11000		5	
	278	8000		8	
	274	34000		6	
	272	656000		24	
Corn. Fulton & Pearlstr.		111000		12	
		895000	6130	55	111
Fultonstreet	35	54000		6	
	33/34	30000		1	
	31	125000		30	
	29	437000		5	
	27	12000		8	
	(47000)				
Corn. Fulton and Waterstr.		25000		9	
		353000	967	59	16
		77000			
		276000			

1	2	3	4	5	6
Waterstreet Block 34	206	8000		5	
Corn. Beekm. & Water	203	20000		5	
		28000	77	10	8
Beekmanstr. Block 27	101	8000		3	
	99	16000		4	
	97	23000		6	
Corn. Beekm. and Cliff Str.		77000		14	
		124000	339	27	12
Cliff Str.	52	5000		4	
	50	9000			
	48	134000		20	
	46	7000		10	
	44	3000		4	
	42	30000		6	
Fulton Corn. Cliffstreet		42000		17	
		230000	630	61	10
Fultonstr.	51	7000		12	
	49	27000		14	
	47	93000		10	
	45	29000		15	
	43	3000		8	
Corn. Fulton and Pearlstr.		123000		25	
		282000		84	

1	2	3	4	5	6
Fultonstreet		282000		87	
	41	78000		14	
		360000	986	98	10
Corn. Fulton and Pearlstr.		48000		21	
Pearlstr.	269	97000		43	
	271	27000		10	
	273	44000		41	
	275	11000		19	
	277	54000		12	
	279	27000		6	
Corn. Cliff and Beekm. Str.		308000	844	152	5
		5000		3	
Block 27 Pearlstr.	283	71000		30	
		71000	194	30	6
Corn. Cliff & Beekm. Str.		160000		25	
		160000	438	25	17
Pearlstr. Block 27	281	250000		2	
		250000	685	2	
Beekmanstr. Block 24	85	82000		24	
	83	28000		12	
	81	387000		22	
	79	27000		6	
	77	84000		20	
		608000		84	

1	2	3	4	5	6
		608000		84	
Beekmanstr.	75	38000		12	
	73	27000		10	
	71	290000		35	
	67/69	25000		15	
Corn: Go Nob.. Gaeston		60000		27	
		1048000	2871	183	15
Goldstr.	64/62	57000		20	
	60	21000		8	
	56/58	85000		40	
Corn: Gold and Fulton Str.		214000		40	
		377000	1033	108	9
Fultonstr. Block 14	77	17000		10	
	73	62000		33	
Corn: Fulton and Goldstreet		334000		165	
Fultonstr. Block	~~73~~	~~20000~~		~~43~~	
	69	75000		33	
	67	16000		12	
	65	42000		12	
	63	48000		17	
	61	181000		30	
	59	92000		42	
	57	97000		50	
		551000		146	
		984000	2641	164	6

1	2	3	4	5	6
Corn: Fulton Cliff str.		80000		44	
Cliffstr. Block 24	45	5000		2	
	47	8000		6	
	49	16000		15	
	51	29000	378	12	5
Corn: Beekman and Cliff str.		55000	4	113	
Beekmanstr. Block 19	59	47000		19	
	57	58000		16	
	55	56000		38	
	53	112000		17	
	51	92000		63	
	47	17000		7	
	45	24000		10	
Corner Beekman and William str.		352000		80	
		811000	2222	263	8
Williamstreet	164	157000		43	
	162	51000		38	
	160	300000		18	
	158	126000		34	
Corn: William and Ann str.		267000		50	
		901000	2468	183	13
Annstreet Block 19	79				

1	2	3	4	5	6
Corner Ann and Gold street					
Goldstreet Block 19	59	19000		6	
		19000	52	6	9
Corn: Gold and Ann str.		5000	52	5	4
Corn: Gold and William str. Block 18		4000		3	
		4000		8	
Annstreet	86	30000		11	
	74/84	1067000		350	
		1376000	3769	369	10
Corn: Ann and William str.		87000		8	
Williamstr.	152	155000		15	
	150	103000		15	
	148	32000		10	
	146/48	68000		35	
Corn: William		445000	1219	83	14
and Fultonstr.		90000		16	
Fulton	99	14000		7	
Corner William and Fultonstr.		10000		5	
		114000		23	

1	2	3	4	5	6
		116000		58	
Fultonstreet	97	73000		28	
	87	48000		36	
	85	21000		8	
	83	7000		3	
		263000	721	103	7
Corner Gold and Fultonstreet Block 18		44000		24	
Goldstreet	55	25000		1	
		69000	189	25	7
Corner Beekman and William str.		46000		42	
Beekmanstr. Block 9	33	64000		18	
	31	423000		55	
	29	51000		20	
	27	38000		24	
	25	96000		35	
	23	70000		20	
	21	133000		20	
	19	76000		22	
	15/17	274000		50	
	13	41000		12	
Corner ...		47000		25	
		1329000	3641	343	11

1	2	3	4	5	6
Nassaustr.	132	5000		6	
	130	13000		8	
Cor. Beekm. and Nassaustr.		3000		1	
Nassaustr. Block 9	128	32000		10	
	124/26	37000		20	
	122	209000		11	
	120	43000		16	
	118	88000		15	
	116	39000		20	
	114	89000		18	
	110/112	5000		6	
	108	9000		4	
Cor. Nassaustr. Annstr.		65000		31	
		637000	1745	166	11
Annstr.	37	11000		4	
	39	11000		4	
	41	129000		18	
	43	7000		4	
	45	8000		12	
	47	29000		24	
	49	35000		32	
	51	12000		12	
	53	66000		22	
	55	15000		6	
	57	52000		30	
		375000		168	

1	2	3	4	5	6
		375000		168	
Annstreet	59	107000		47	
Near 57/59 Annstreet		58000		18	
Annstreet	61	5000		6	
Cor. Annstr. Williamstr.		123000		30	
		668000	1830	269	6
Williamstr. Block 9	161	113000		24	
	163	30000		18	
	165	10000		6	
	167	139000		17	
	169	5000		4	
Corner William and Annstreet		44000		50	
		341000	934	119	8
Annstreet Block 8	60	116000		18	
		116000	317	18	17
54/6 Corner Annstr. and Fultonstr. 115		200000		25	
		200000	548	25	22
Corner Annstr. and Fultonstr. 117		233000		18 ~~43~~	
		33000	90	18	5
57 Annstr. and 111–113 Fultonstr.		229000		50	
		229000	627	50	12

1	2	3	4	5	6
Annstreet	50	40000		27	
	48	18000		3	
	46	13000		8	
		71000	194	38	5
Cor. Ann and 127 Fult. Street		121000		26	
		121000	331	26	12
Annstr.	42	5000		4	
		42000		8	
		47000	129	12	11
Cor. Nassaustr. Annstr.		173000		32	
		173000	473	32	15
Nassaustr. Block 8	102	40000		5	
Cor. Ann and Nassaustr.		97000		82	
Nassaustr.	100	124000		30	
	98	40000		21	
Cor. Nassau and Fultonstr.		601000		108	
		902000	2471	246	10
Fultonstr.	125	254000		53	
	123	128000		41	
	121	5000		1	
		387000		95	

1	2	3	4	5	6
		387000		95	
Fultonstr. Block 8	119	48000		12	
	117	91000		37	
	109	107000		35	
	107	69000			
	105	76000		47	
Cor. William and Fultonstr.		370000		142	
		1148000	3145	[illegible]8	8
Williamstr. vide p. 180	149	29000		16	
		29000	79	16	5
Cor. Fulton and Nassaustr.		64000		14	
Fultonstr. Block 6	124	91000		34	
	122	516000		62	
	120	346000 ~~66000~~		41	
	118	286000 ~~28000~~		40	
	116	289000		94	
	114	292000		100	
Cor. Fulton and Dutchstr.		69000		30	
		1451000	3975	415	9
Dutchstr.	d. Col.	1886000			
	17	22000		4	
	15	44000		6	
	9/11/13	142000		15	
	5	21000		16	
Cor. Dutchstr. Johnstr.		151000		44	
		380000	1041	85	12
Johnstr.	47	74000		16	
	45	9000		8	
		83000			

1	2	3	4	5	6
Johnstr.:	43	83000 58000		7	
	41	114000		46-	
	39	32000		14-	
	37	49000		16-	
	35	50000		10-	
	33	~~19000~~ 6000		13-	
Cor. Nassau and Johnstreet		74000		27-	
		466000	1276	144	9
Nassaustr.: Block 6	74	11000		8-	
	76	19000		13-	
	78	46000		25-	
	80	84000		36-	
117000	82	117000		42-	
	84	90000		24-	
(82 and 84 mixed)	82	1000		2-	
	82/84	28000		8-	
	86	111000		34-	
	88	55000	1564	216 24-	7
Cor. Nassau & Fultonstr.		15000 140000		16-	
Fultonstr. Block 17	110	22000		6-	
	106/108	286000		150-	
	104	167000		70-	
	102	39000		34-	
	100	83000		30-	
Cor. William & Fultonstr.		21000		8-	
		618000	1693	298	6

1	2	3	4	5	6
Block 17 Fultonstr. Williamstr.	139	86000		20-	
	135/137	46000		25-	
	133	23000		10-	
	131	133000		86-	
	127/129	45000		20-	
	123	4000		4-	
	119/121	167000		40-	
	115/117	179000		45-	
		~~683000~~	~~1871~~	~~200~~	9
Cor. John & Williamstr.:		83000		30-	
Johnstr.	57	133000		60-	
Cor. John & Dutch Str.		159000		48-	
		292000	800	108	7
Dutchstr. Block 7	12	61000		15-	
	10	12000	200	16-	6
Cor. William & Fultonstr.:		14000		23-	
Fultonstr. Block 17	98	120000		15-	
	96	22000		10-	
	94	53000		36-	
	92	149000		30-	
	90	141000		38-	
	88	4000		8	
	86	3000		2	
	82	24000		9-	
	78	24000		11-	
		519000	1422	157	9

1	2	3	4	5	6
Cor. Fulton and Goldstr.:		18000		10-	
Goldstreet	47	50000		23-	
	45	46000		18-	
	43	7000		10-	
	41	4000		4-	
	33	53000		18-	
	29/31	9000		9-	
Cor. Gold and Johnstreet		37000		30-	
		224000	6148	122	50
Johnstr.:	83	57000		10-	
	79	114000		47-	
	77	143000		50-	
	75	15000		8-	
	71	127000		35-	
Cor. John and Williamstr.:		33000		20-	
		489000	1339	170	8
Williamstr. Block 17	114	9000		10-	
	116	50000		9-	
	118	10000		8-	
	120	31000		22-	
	126	37000		10-	
	128	10000		2-	
	130	30000		6-	
	134/136	357000		75-	
	138	38000		7-	
		570000	1561	149	10
Fultonstr. Block 23	74/76	7000		7	
		7000		7	

1	2	3	4	5	6
Cor. Gold and Fultonstr.:		7000 18000		7 16-	
Fultonstreet	76	54000		7-	
	74	27000		8-	
	74/76	11000		8-	
	70/76	144000		50-	
Cor. Fulton and Ryders Alley		178000		65-	
		434000	1202	161	7
Fultonstr. Block 2	66/68	41000		18-	
	64	54000		28-	
	62	50000		24-	
	60	35000		7-	
	58	51000		21-	
	58/60	57000		22-	
Cor. Cliff and Fultonstr.		157000		58-	
		445000	1219	158	7
Cliffstr. Block 8	27	87000		22-	
	25	129000		24-	
	23	25000		8-	
	21	108000		57-	
	19	93000		50-	
	17	123000		36-	
	11/13	100000		26-	
	7/9	122000		30-	
		787000	2156	253	8

1	2	3	4	5	6
Cor. Johnst. and Cliff st.		77000		26	
Johnst.	97	3000 ~~42000~~		4	
	95	20000		10	
	93	15000		10	
	91	7000		6	
of. Total		~~160000~~ 122000	441	56	8
Gold st. Block 25	30	6000		5	
	38	20000		12	
	40/42	78000		12	
	44	33000		5	
	46	7000		4	
Cor. Cliff st. and Fulton st.		11000		7	
		155000	424	45	9
Fulton st. Block 26	50	20000		10	
	48	27000		13	
	46	133000		15	
	44	22000		12	
	42	21000		12	
	40	91000		28	
Cor. Fulton and Pearl st.		14000		5	
Gold st.		22000		4	
		350000	959	99	9

1	2	3	4	5	6
Pearlstreet	261	11000		6	
	257	27000		18	
	255	11000		6	
	251	130000		20	
	249	5000		9	
	247/49	10000		2	
	245	32000		14	
Cor. Pearl and Johnstreet		64000		15	
		384000	1052	90	11
Johnst.	113	11000		8	
	107	2000		1	
	105	12000		4	
Cor. Cliff st. and Johnst.		86000		19	
		111000	308	32	9
Cliff st. Block 26	14	4000		7	
	16	5000		4	
	18	36000		12	
	20	42000		8	
	22	29000		7	
	24	18000		8	
	26	36000		8	
	28	13000		6	
	32	30000		7	
	34	19000	635	[illegible]	9
Cor. Fulton and Pearl st.		238000		20	
Block 33		[illegible]		20	

1	2	3	4	5	6
Fulton street Block 33		85000		20	
	38	9000		5	
	36	11000		9	
Cor. Fulton and Waterstreet		51000		18	
		159000	435	52	8
Waterstreet	198	556000		60	
	194	33000		3	
	186/190	100000		20	
	184	4000		2	
	182	693000	1899	85	22
Burling Slip	5	3000		1	
	3	23000		4	
		26000	71	5	14
Pearl st. Block 33	242	44000		8	
	244	26000		13	
	246	16000		5	
	252	6000		2	
	254	179000		39	
	258/60	417000		48	
	262	93000	2137	12	16
Cor. Water and Fulton st.		12000		9	
Block 41		22000		9	

1	2	3	4	5	6
Fulton st.		92000		9	
	26	36000		14	
	24	13000		6	
	22	11000		6	
	20	121000		33	
		203000	556	68	8
Frontstreet	196	7000		5	
	194	25000		10	
	190	3000		~~10~~ 2	
	186	29000		15	
	184	4000		3	
Cor. Front and Burling Slip		25000		7	
		93000	254	42	6
Burling Slip	17	11000		7	
Cor. 181 Waterst. and Burling Slip		4000		3	
		15000	41	10	4
Waterstreet Block 41	185/187	5000		8	
	189/191	9000		12	
	197	7000	57	3	2
Cor. Fulton and Frontstreet		10000		[illegible]	
Fulton st.	116	9000		4	
		109000		20	

1	2	3	4	5	6
		109000		20	
Southstreet	14	11000		11	
	12	46000		10	
	10	157000		55	
	8	9000		9	
	(204/206)	264000		81	
	2	16000		6	
Corner Fulton and Southstr.		118000		50	
		730000	2000	242	8
Southstr.	92	40000		16	
	91	67000		16	
	90	11000		5	
	89	47000		16	
Corner Southstr. and Burling Slip		34000		18	
		199000	545	73	7
Burling Slip	31/35	50000		12	
	29	6000		6	
Corner Front and Burling Slip		9000		6	
		65000	178	24	7
Frontstreet Block 49	189/91	10000		16	
		10000	27	16	2
Corner Southstr. Burling Slip		36000		16	
Burling Slip Block 48	38	7000		2	
	34	3000		2	
	32	4600.0		12	
		92600		32	

1	2	3	4	5	6
		92000		32	
Burling Slip	26	4000		1	
		96000	263	33	8
Frontstr. Block 48 Ward 10	171	4000		1	
	167	3000		1	
	165	4000		4	
	163	7000		6	
Corner Frontstr. and Fletcherstr.		67000		15	
		85000	233	27	8
Maiden Lane Block 47 Ward 10	157	4000		6	
	159	4000		2	
	161	4000		2	
	163	6.000		6	
Corner Maiden Lane and South Str.		114000		10	
		132000	362	26	14
Corner 38 South Str. and Fletcherstr.		14000	-	10	
Southstreet Block 48 Ward 10	80	7000		3	
	83	45000		11	
	85	58000		3	
	86	54000		12	
		178000	488	74	12
Corner Burling Slip and Front Str.		3000		4	
		3000	8	4	2
Corner Burling Slip and Waterstr.		22000		11	
Block 40 Ward 10		22000		11	

1	2	3	4	5	6
		22000		11	
Waterstreet	177	11000		6	
	175	4000		3	
	173	5000		4	
	169	3000		1	
	167	7000		4	
	165	4000		3	
Corner 161/163 Waterstr. and Fletcherstr.		14000		25	
		70000	192	57	3
Fletcherstreet Block 40 Ward 10	20	4000		4	
	22	11000		2	
Corner Fletcherstr. and Frontstr.		21000		12	
		36000	98	18	5
Frontstr.	164	9000		6	
	166	4000		3	
	168	4000		2	
	176	3000		2	
	178	11000		8	
Corner Fletcherstr. and Frontstr.		9000		4	
		40000	109	25	4
Waterstreet	157	5000		3	
	155	11000		3	
		000			
Corner Waterstr. and Maidenlane		36000		12	
Block 39 Ward 10		52000	142	18	8

1	2	3	4	5	6
Maidenlane Block 39 Ward 10	137	21000		6	
Corner Front and Maiden Lane		13000		5	
~~Corner Waterstr. and Frontstr.~~		34000	93	11	8
Corner Burling Slip		4000		3	
Burling Slip Block 32 Ward 10	4	4000		7	
Corner Burling Slip and Pearlstreet		67000	195	6	
		75000	194	18	~~15~~ 12
Pearlstreet	230	7000		3	
	228	2000		15	
	226	6000		4	
	222	43000		32	
	220	5000		2	
	218	26000		13	
	216	20000		6	
	214	271000		20	
Corner Pearl and Fletcherstreet		19000		9	
		399000	1093	90	12
Fletcherstreet	4	11000		5	
		11000	30	5	6
Waterstreet	160	5000		4	
		5000			

1	2	3	4	5	6
Waterstreet Block 32 Ward 10	164	4000		2	
	166	7000		5	
	168	4000		2	
	170	4000		2	
	172	4000		2	
	174	7000		8	
	178	7000		5	
	178½	4000	126	2	4
Corner Fletcher and Pearl street		27000		5	
Corner Pearl and Maidenlane		7000		4	
		34000	93	9	10
Maidenlane Block 21 Ward 11	115	3000		2	
	119	4000		4	
	123	25000		10	
	125	14000		10	
	129	14000		5	
Corner Maidenlane and Waterstr.		33000		13	
		93300	255	44	6
Corner Waterstr. and Fletcherstr.		5000		5	
		5000	14	5	3
Johnstreet Block 22 Ward 11	116	4000		1	
	114	11000		2	
	112	2000		2	
	108	50000		5	
	106	33000		5	
	104	52000		25	
		152000		40	

1	2	3	4	5	6
		152000		40	
Johnstreet Block 22 Ward 11	102	11000		8	
Corner Johnstr. and Pearlstr.		44000		10	
Johnstreet Block 21	98	33000		6	
Corner of John and 19 Plattstr.		28000		5	
Johnstr.	94	51000		4	
	92	50000		22	
Corner Johnstr. and Goldstr.		6000		4	
		375000	1027	99	10
Corner Gold and Plattstr.		64000		25	
		64000	175	25	7
Plattstr.	21	125000		59	
	13	31000		4	
	3	9000		4	
	1	10000		9	
Corner Plattstr. and Pearlstr.		13000		8	
		138000	515	84	6

1	2	3	4	5	6
Pearlstreet Block 22 Ward 11	227	21000		5	
	229	4000		2	
	231	11000		4	
Corner Platt and Pearlstr.		3000		4	
		12000	10	[illegible]	
		188000	121	20	6
Corner 14/16 Platt and 49 Pearlstr.		9000		5	
		18000		8	
Plattstr. Block 21 Ward 11	8/10	3000		10	
	12	7000		3	
	14	18000	318	5	12
	7,8,10	411000		35	
Goldstreet	8	18000		4	
	6	6000		2	
	4	3000		1	
Corner Goldstr. and Maidenlane		21000		8	
		451000	125	50	25
Goldstr.	~~6~~	~~6000~~		~~2~~	
	~~4~~	~~3000~~		~~1~~	
Corner Goldstr. and Maidenlane		~~21000~~		~~8~~	
Maidenlane	91	3000		1	
		3000		1	

1	2	3	4	5	6
Maidenlane	93	48000		27	
	95	25000		3	
	97	24000		13	
	99	16000		13	
	101	14000		6	
	103	11000		8	
	105	25000		14	
Corner Pearlstreet and Maidenlane		24000		7	
		190000	521	92	5
Pearlstreet Ward 11 Block 21	203	41000		15	
	205	4000		2	
	207	22000		7	
	209	45000		31	
	213	4000		2	
	215	30000		7	
	217	24000	466	12	6
Corner 14 John and Pearlstr.		23000		6	
Johnstr. Block No Ward 11	88	34000		22	
	86	28000		14	
	84	104000		25	
	82	21000		5	
	80	13000		5	
	78	52000		10	
	76	116000		36	
	74	19000		6	
	72	40000		24	
		450000	1233	153	8

1	2	3	4	5	6
Cum: John and Williamstr:		61000		20 -	
Williamstr:	104	89000		9 -	
	102	17000		4 -	
	100	29000		12 -	
	98	48000		26 -	
		244000	668	71	9
Goldstreet	21 Block 16	4000		2 -	
		4000	55	2	26
Cum: Gold and Platterstreet		74000		13 -	
		74000	202	13	16
Platterstr:	28 Block 15	9000		6 -	
	30	6000		3 -	
	32	7000		3 -	
	38	18000		6 -	
Cum: William and Platterstr:		64000		45 -	
		104000	285	63	4
Williamstr:	90	26000		12 -	
	88	62000		35	
	86	19000		9 -	
Cum: Maidenl. and Williamstr:		27000		12 -	
		134000	367	68	5

1	2	3	4	5	6
Maidenlane	67	11000		3 -	
	71	4000		3 -	
	73	50000		12 -	
	75	28000		10 -	
	81	31000		16 -	
	83	7000		5 -	
Cum: Maidenl. and Goldstreet	85	4000		3 -	
		3000		2 -	
		138000	378	54	7
Goldstreet	9 Block 15.	36000		14 -	
	11	25000		6 -	
	13	4000		4 -	
Cum: William and Johnstr:		65000 / 140000	178	4 32	7
Johnstreet	Block 5			32	
	66	9000		5 -	
	64	78000		13 -	
Cum: John and Williamstreet		61000		37 -	
Johnstr:	62	71000		34 -	
	60	114000		40 -	
	58	136000		40 -	
	56	137000		25 -	
	54	11000		5 -	
	50	83000		24 -	
	48	21000		10 -	
		[illegible]000		265	

1	2	3	4	5	6
		861000		205	
Johnstreet	42	117000		14 -	
	36	16000		6 -	
	34	33000		8 -	
Cum: Hassen and Johnstr:	12	42000		12 -	
Johnstreet	32 Block 5.	70000		22 -	
		1139000	3120	327	9
Hassenstreet.	68	52000		9 -	
	66	75000		29 -	
	64	87000		28 -	
	62	106000		18 -	
Cum: Maidenl. and Hassenstr:		244000		63 -	
		564000	1545	139	11
Maidenlane	31	200000		36 -	
	33	102000		24 -	
	35	157000		49 -	
	37	166000		37 -	
	39	138000		47 -	
	41	118000		38 -	
	43	181000		32 -	
	45	92000		43 -	
	47	56000		7 -	
	49	84000		34 -	
		1294000		347	

1	2	3	4	5	6
		1294000		347	
Maidenlane	51	177000		59	
	53	4000		2	
	55	59000		16	
	57	114000		23	
	59	83000		15	
	61/59	92000		34	
	63	144000		28	
Cum: Maidenl. and Williamstr:		77000		23	
		2044000	560	547	10
Williamstr:	87 Block 5.	10000		6 -	
	91	17000		14	
	93	22000		6	
	97	31000		14	
	99/101	139000		40	
	103/105	44000	421	18	7
Cum: Maidenl. and Hassaustr:		72000		20	
Maidenlane.	30	137000		26	
	32	152000		49	
	36 Block	85000		29	
	38	64000		14	
	40	47000		12	
	42	33000		10 -	
	44	48000		18	
	44½	32000		5	
	46	73000		24	
	48	139000		34	
	50	51000		15	
		953000		256	

1	2	3	4	5	6
52	52	40000		12	
Maidenlane Block 4	54	110000		36	
	56	37000		8	
	58	20000		6	
	60	33000		8	
Corner Maidenlane and Williamstr.		107000		25	
		300000	356	51	10
Cor. Liberty and Williamstr.		199000		43	
Libertystreet	23	50000		10	
	31	10000		4	
	39	83000		7	
	41	13000		2	
	43	83000		22	
	47/49	122000		20	
	51	69000		15	
Corner Nassaustr. and Libertystr.		21000		9	
		451000	1235	89	14
Nassaustr. Block 4	40/46	52000		7	
	44	10000		5	
	46	10000		5	
	42	12000		15	
	48	8000		2	
	50	34000		12	
Maidenlane		186000	509	46	11
Corner Williamstr. and Libertystr.		86000		32	
Block 14		86000	235	32	7

1	2	3	4	5	6
Corner 66 Maidenlane and Williamstr.		9000		3	
		9000	24	3	8
68 Maidenlane: Corner 11 Libertystr.		13000		3	
		13000	36	3	12
Corner 70 Maidenlane and 9 Libertystr.		36000		8	
		36000	98	8	12
Corner 74 Maidenlane and 5 Libertystr.		47000		8	
		47000	129	8	16
Maidenlane Block 14	74½	6000		2	
	74	78000		31	
Corner Maidenlane and Libertystr.		78000		14	
		162000	444	47	9
Corner Nassau and Libertystr.		22000		4	
Corner 38/40 Liberty, 60 Cedar, 30 Nassau		222000		38	
		244000	668	42	16
Libertystr. Block 14	36	17000		2	
	34	6000		2	
	30	89000		22	
	24	214000		44	
	20	74000		25	
Liberty and Williamstr.		27000		10	
		424000	1161	108	11
Williamstr.	75	38000		6	
		~~38000~~		6	
		Cr 38000			

1	2	3	4	5	6
Williamstr. Block 13	73	172000		28	
	71	18000		3	
	69	2000		1	
	67/69	10000		3	
Corner 67 Williamstr. and Cedarstreet		18000		5	
Cor. 41 Cedarstreet and Williamstr.		11000		6	
		269000	737	52	14
Cedarstr.	45	79000		12	
	47	67000		4	
	49	11000		2	
	51	58000		41	
	55	119000		13	
	57	133000		20	
	59	69000		20	
	61	112000		16	
Corner 28 Nassau and Cedarstr.		11000		1	
		659000	1505	129	14
Nassaustr. Block 13	30	22000		7	
	32	11000		4	
	36	22000		6	
	38	41000		13	
		96000	263	30	9

1	2	3	4	5	6
Corner Liberty and Williamstr.		11000		5	
Williamstr.	78	22000		10	
Libertystr. Block 13	2	22000		8	
		55000	151	23	6
Maidenlane	86	44000		12	
	88	219000		53	
	90/94	89000		20	
	96	32000		11	
	98	87000		72	
	100	12000		2	
	102	52000		5	
Corner 108 Maidenlane and Pearlstr.		130000		20	
		582000	1594	[illegible]	3
Pearlstr.	193	9000		2	
Corner Pearl and Cedarstreet		17000		10	
		26000	71	12	6
Cedarstr.	3	30000		3	
		30000		3	

1	2	3	4	5	6
Cedarstr:	5	9000		3 ✓	
	7	39000		12 ✓	
	13	56000		7 ✓	
	15	11000		2 ✓	
	17	56000		12 ✓	
	23	13000		5 ✓	
Corner William and Cedarstr:		690000		48 ✓	
		904000	2476	92	27
Williamstr: Block 30	68/70	52000		28 ✓	
	72	69000		6 ✓	
	74	59000		25 ✓	
	76	87000		4 ✓	
		266000	729	63	11
Corner 114 Maiden lane Pearl street		28000		?	
Waterstreet Maidenlane Block 30	130	28000		20 ✓	
		56000	153	20	8
Waterstreet	146	6000		2 ✓	
	144	11000		5 ✓	
	140	60000		7 ✓	
	136	111000		20 ✓	
	134	48000		11 ✓	
Corner Pinestr		236000	646	45	14
Pearlstreet	172	10000		4	
	178	11000		4	
	180	22000		8	
		43000		16	

1	2	3	4	5	6
Pearlstr. Block 30	182/186	28000		16 ✓	
	188	85000		22 ✓	
	190	79000		3 ✓	
	192	64000		12 ✓	
		229000	627	69	9
Maiden Lane	140	6000		3 ✓	
		6000	16	3	5
Frontstr: Block 38	154	6000		3 ✓	
	152	8000		6 ✓	
	146	17000		7 ✓	
	144	7000		2 ✓	
146 Corner of Depeysterstr. N. West Corner		13000		4 ✓	
		51000	139	22	6
141 Frontstr. Corner of Depeysterstr.		6000		2 ✓	
		6000	16	2	8
Frontstr: Block 40	145	17000		4 ✓	
	151	7000		4 ✓	
		24000	66	8	8
137/139 Waterstr. Corner of Depeyster and Pinestr.		145000		32 ✓	
		145000	397	32	12
133 Waterstr. Corner Pinestr. S.E. corner		78000		12 ✓	
		78000	214	12	18
157 Frontstr. Corner of Maiden Lane S.E. corner		20000		6 ✓	
Maiden Lane Block 40	164	3000		2 ✓	
	166	44000		6 ✓	
168 Maiden Lane Corner Southstr.		33000		6 ✓	
		80000	219	20	11

1	2	3	4	5	6
75 Southstr. Corner of Maiden Lane Block 45		6000		3 ✓	
South-Str:	73/74	7000		2 ✓	
71/72 South str. Corner Depeysterstr.		17000		5 ✓	
		30000	82	10	8
Depeyster Str.	31	67000		5 ✓	
		67000	183	5	36
139 Frontstr: Corner of Depeyster str. N.E. Corner		44000		8 ✓	
Front-Str. Block 40	141	22000		3 ✓	
	143	12000		2 ✓	
		78000	214	13	16
137 Frontstr. Corner of Depeyster Str. S.E. Corner		6000		2 ✓	
34/36 Depeyster str. Corner South-Str. 76 Southstr.		6000		2 ✓	
		12000	33	4	8
69 Southstr. Corner Pinestr. North C.		89000		3 (?)	
		89000	244	3	81
Pinestr:	90	47000		10 ✓	
		47000	129	10	13
133 Frontstr. Corner Pinestr.		11000		3 ✓	
Frontstr. Block 45	135	15000		6 ✓	
		26000	71	9	8

1	2	3	4	5	6

Continuation (page 200)

(3)

Remarks:

Column
1 = Street.
2 = Number of the house
3 = Consume of Gas per Year in Cubicfeet average.
4. = Consume of Gas per Day average ($\frac{\text{Cub: feet}}{365}$)
5 = Number of burners.
6. = Consume of Gas by every burner per Day ($\frac{\text{Column 4}}{\text{Column 5}}$).

4) Remark: The numbers, written with pencil, are doubtful.

Block	Cub: Feet Consumed Gas per Year	Numb: of Burners	$\frac{\text{Cub: Feet}}{\text{Burners}} = x$; $\frac{x}{365} = y$
			x y
10	3679000	550	
20	1783000	200	
25	1651000	358	4612:365=13
28	857000	100	
35	701000	237	
43	540000	112	
51	1706000	133	12827:365=35
50	3728000	536 and 1/2	6955:365=19
42	1450000	569	2548:365=7
34	1578000	163	9810:365=27
27	1343000	368	
24	2687000	799	3363:365=9
19	1731000	452	3829:365=10
18	2153000	580	3712:365=10
9	2975000	897	3316:365=9
8	3752000	±849	
6	2868000	860	
7	983000	637	2281:365=6
17	1802000	598	3013:365=8
23	1987000	693	2672:365=7
26	1077000	203	
33	1658000	269	6165:365=17
41	332000	143	2322:365=6
49	1004000	355	2828:365=8
Transp	44025000	1074 1/2	

Vide Block 22 u. 21 page 187.

Block	Cub: Feet Consumed Gas per Year	Numb: of Burners	$\frac{\text{Cub: Feet}}{\text{Burners}} = x$; $\frac{x}{365} = y$
	44025000	1075 1/2	
			x y
47	132000	26	5077:365=14
48	362000	103	3514:365=10
40	146000	100	1460:365=4
39	86000	29	2966:365=8
32	531000	143	3713:365=10
31	132000	58	2276:365=6
22	666000	228	2986:365=8
21	944000	249	
16	698000	226	3088:365=8
15	515000	222	2320:365=6
5	4010000	1111	3609:365=10
4	1937000	486	3986:365=11
14	353000	101	3495:365=10
3	1692000	361	4687:365=12
13	1833000	315	
	~~52062000~~	~~1450 1/2~~	~~:365=11~~
30	521000	134	
38	57000	25	2280:365=6
37	145000	32	4531:365=11
36	1161000	182	6379:365=19
46	285000	58	4914:365=13
45	174000	6	
44	1020000	239	4268:365=11
	61438000	15204 1/2	(4039:365=11,1)

Block	Cubic Feet of Consumed Gas per Year	Number of burners	$\frac{\text{Cub:Feet}}{\text{Burners}} = x;\ \frac{x}{365} = y$
	61438000	15204 $\frac{4}{2}$	4039 : 365 = 11,1
1			" : 300 = 13,5
2			
11			
12			
29			
cf. page 171 Block 35 +	9000		
	61447000		
÷	70000		
cf. page 174 Block 34	61370000		
+ cf. pg. 179	256000		
	61626000		
÷ cf. pg. 182	39000		
	61587000		
+ cf. pg. 179	167000		
	61754000		
	61754000	15204 $\frac{4}{2}$	4061 : 365 = 11,1
Block 36			" " : 300 = 13,5
Contin:	252000	57	
29	1170000	237	
12	227000	82	
	63879000	15264	4050 : 365 = 11,1
cf. pg. 194 Block 24		5	" : 300 = 13,5
Block 11	~~2371000~~	~~688~~	
" "	4194000	1319	
	35000		
" 2	3676000	355	
" 1	3543000	448	
Final	75730000 actual gas	17971 $\frac{4}{2}$	

5.) Index.

Milton Market
Book 3

Continuation of page 193.

1	2	3	4	5	6
	Pine and 111 Front. South com. 6 & Sect.	7000		3 ✓	
Pinestr. (Block 36)	97	16000		5 ✓	
	95	4000		2 ✓	
	131 Frontstr. Corn. of Pinestr. S.E. corn.	40000		10 ✓	
		67000	183	20	9
Frontstr.	129	22000		6 ✓	
	125/127	208000		20 ✓	
	121/123	116000		39 ✓	
	119	50000		8 ✓	
	117	18000		6 ✓	
	41	47000	1134	79	14
Wallstr.	106	27000		12 ✓	
	108	51000		15 ✓	
	110	38000		7 ✓	
	112	14000		6 ✓	
	114	93000		24 ✓	
	116	33000		8 ✓	
	118	54000		8 ✓	
	60 Southstr. Corn. Wallstr.	49000		7 ✓	
		359000	983	87	11
Southstr. (Block 40)	61	28000		7 ✓	
	62	22000		10	
	65/66	19000		10	
	66	19000		10	
	67	92000		16	
		180000	493	53	9
Frontstr. (Block 36)	132	44000		11 ✓	
	87 Pinestr. and 132/134 Frontstr.	10000		9 ✓	
		54000	148	18	8

1	2	3	4	5	6
	133 Waterstr. Corn. Pine str.	7000		2	
Waterstr. (Block 36)	133	7000		2 ✓	
	131	60000		15 ✓	
	127/129	100000		28 ✓	
	127	22000		8 ✓	
	123/125	495000		14 ✓	
	121	83000		16 ✓	
	90 Wallstr. Corn. Waterstr. S.E. Corn.	50000		8 ✓	
		824000	225	93	24
Wallstr.	90	10000		5 ✓	
	92	15000		3 ✓	
	94	14000		8 ✓	
(60000)	96	60000		13 ✓	
	98	14000		6 ✓	
	100	9000		3 ✓	
	102/104	31000		9 ✓	
	Corner Frontstr. and Wallstr.	44000		8 ✓	
Wallstr. Block 36	104	8000		4 ✓	
		205000	561	59	9
Frontstreet Block 36	120	79000		21 ✓	
	122	5000		8 ✓	
	124	43000		9 ✓	
	126	11000		3 ✓	
	128	11000		4 ✓	
	130	36000		12 ✓	
		282000		57	

1	2	3	4	5	6
	~~Corn. 130 Water str. Pine str.~~	—	—	—	—
Water Street	130/132	~~46000~~		~~11~~	
Pinestreet (Block 29)	83	11000		3 ✓	
	81	1000		3 ✓	
	79 & 166	75000		14 (?)	
	79	33000		8 ✓	
		120000		28	
Pearlstr.	168	4000		2 ✓	
	166	18000		5 ✓	
	164	274000		14 ✓	
	162	39000		14 ✓	
	160	7000		7 ✓	
	158	11000		6 ✓	
		353000		48	
Wallstreet (Block 48)	80	16000		3 (?)	
	78	164000		22 ✓	
	82	106000		24 ✓	
	88	9000		3 ✓	
	84	71000		22 ✓	
	86	103000		26 ✓	
	84/86	22000		11 ✓	
		491000		111	
Waterstreet	130/132	46000		11 ✓	
	118	21000		7 ✓	
	120	87000		17 ✓	
	122	4000		1 ✓	
	124	18000		5 ✓	
	126	11000		3 ✓	
	128	19000		6 ✓	
		206000		50	

1	2	3	4	5	6
Pearlstreet	181	27000		12 ✓	
		27000		12	
Cedarstreet (Block 12)	2	4000		4 ✓	
	10	14000		8 ✓	
	12	13000		6 ✓	
	16	11000		4 ✓	
	18	9000		?	
	20	20000		12 ✓	
	24	14000		5 ✓	
	28	32000		8 ✓	
	36/38	32000		9 ✓	
		149000		56	
Williamstreet	62	28000		8 ✓	
	60	23000		6 ✓	
		51000		14	

Continuation in book 19.

1	2	3	4	5	6
Williamstreet	60			13	
	58	76000		71	
	56	33000		2	
	Corner William and Pinestreet	18000		5	
		127000		91	
Pinestreet (Block 12)	48	111000		16	
	50/52	244000		?	
	54	113000		31	
	56	43000		12	
	58	19000		13	
	62	27000		11	
	64	?		6	
	66	45000		32	
		602000		121	

1	2	3	4	5	6
		602000		121	
Pinestreet	66½	21000		16	
	68	8000		2	
	70	21000		8	
	70½	31000		10	
	72	15000		5	
	74	8000		2	
	76	8000		2	
		714000		169	
171 Pearl, Corner of Pinestreet 12		. . .		.	
Pearlstreet, Block 12	173	4000		1	
	175	2000		2	
	177	32000		1	
	~~179~~ 77	38000		4	

Block 11.

1	2	3	4	5	6
S.W. Corner of Pearl & Pinestr. and No 77 Pinestreet		239000		125	
Pinestreet	73	29000		12	
	67	38000		4	
	65	13000		6	
	63	55000		25	
	59/61	30000		6	
	55/57	42000		18	
	55	2		4	
		446000		200	
52–54 William Street, Corner Pinestreet		2		28	
		28			

1	2	3	4	5	6
Williamstreet, Block 11	~~52/54~~				
	52/54	525000		122	
	52	32000		10	
	52/54	18000		12	
	~~48~~	~~656000~~		~~127~~	
	~~50~~				
		575000		172	
Wallstreet, Block 12	48	656000		127	
	50	694000		139	
	4	23000		18	
	52	316000		119	
	54	340000		84	
	56	153000		77	
	58	39000		15	
	60	43000		8	
	62	175000		45	
	64	49000		19	
	66	127000		41	
	68	164000		37	
	70	67000		27	
	72	15000		20	
	74	36000		69	
		2897000		845	
Pearlstreet	157/159	100000		12	
	161	160000		80	
	165	51000		10	
		311000		102	

Block 2.

1	2	3	4	5	6
61 Williamst. & Corner Pinestr.		96000		22	
Williamstreet	61	98000		16	
	61/63	29000		3	
	57/59	112000		13	
	59	3000		1	
N.E. Corner Pine & Williamstr.		123000		4	
		461000		59	
Pinestreet	44	3000		1	
	42/41	57000		4	
	42	61000		10	
	40	104000		8	
	38	60000		7	
	36	103000		13	
	34½	45000		5	
	34	169000		6	
		1000		1	
	~~34½~~	~~11000~~		~~2~~	
	32	51000		4	
	30	39000		6	
	28	18000		1	
	26	48000		2	
	24	69000		6	
	22	72000		14	
		904000		90	
Nassaustreet	14	124000		7	
	16/18	128000		4	
	20	190000		72	
		1442000		531	

1	2	3	4	5	6
		1042000			
Nassaustreet	22	99000		4	
	24	61000		3	
	26	168000		10	
		1770000		100	
Cedarstreet	62	109000		12	
	62/64	57000		9	
	64	79000		7	
	60	18000		25	
	58	8000		2	
	56	56000		14	
	52	19000		6	
	48	8000		3	
	46	14000		3	
	44	32000		6	
	42	141000		19	
		541000		106	
N.W. Corner Pine & 51 Williamstr.		47000		4	
Pinestreet, Block 1		50000		8	
	51/53	84000		8	
	39	55000		7	
	35	39000		2	
	"	42000		4	
	"	26000		4	
	31/33	341000		37	
	37	36000		5	
	29	27000		4	
	27	139000		11	
	25	187000		5	
	23	700000		228	
		1773000		327	

1	2	3	4	5	6	1	2	3	4	5	6
Wallstreet	34	492000		17							
	36	99000		5							
	38	170000		15							
	40	347000		41							
	42	350000		8							
[illegible]	44	134000		29							
	46	178000		6							
		1770000		121							

1	2	3	4	5	6	1	2	3	4	5	6

6.) 1 Kerosenelamp = ½ Gaslamp = 6 houres daily = 6 Cubicfeet of Gas average

Block	Street	Number of Kerosene lamps	Would be consume of Gas average per Year in Cubic feet	Cubicfeet pr. day	Horse powers	City (Street) Street	Lamps: Number of Lamps	Gas per Year in Cubicfeet
10.	Spruce Str.	—	. . . . . .	. . .	27	Beekmanstreet	15	131400
	William str.	—	. . . . . .	. . .	. . .	Fultonstreet	18	157680
	Beekman str.	—	. . . . . .	. . .	50	Goldstreet	9	78840
	Nassau str.	—	. . . . . .	. . .	120	Cliffordstreet	6	52560
					197	Williamstreet	14	122640
20.	Spruce str.	—	. . . . . .	. . .	16	Pinestreet	3	26280
	Gold str.	—	. . . . . .	. . .	. . .	Nassaustreet	6	52560
	Beekm. str.	—	. . . . . .	. . .	10	Annstreet	5	43800
	William str.	—	. . . . . .	. . .	3	Dutchstreet	2	17520
					27	Ryders Alley	2	17520
25.	Ferry str.	—	. . . . . .	. . .	11	Johnstreet	12	105120
	Cliff str.	—	. . . . . .	. . .	3	Pearlstreet	13	113880
	Beekm. str.	.	. . . . . .	. . .	224	Burling Slip	13	113880
	Gold str.	.	. . . . . .	. . .	3	Fletcherstreet	5	43800
					248	Frontstreet	7	61320
28	Ferry str.	.	. . . . . .	. . .	12	Southstreet	7	61320
	Pearl str.	.	. . . . . .	. . .	12	Waterstreet	6	52560
	Beekm. str.	.	. . . . . .	. . .	. . .	Plattstreet	7	61320
	Cliff str.	.	. . . . . .	. . .	. . .	Maidenlane	26	227760
					24	Libertystreet	11	96360
35.	Peck slip	.	. . . . . .	. . .	2	Cedarstreet	4	35040
	Water str.	.	. . . . . .	. . .	4	Depeysterstreet	3	26280
	Dover str.	.	. . . . . .	. . .	11	Wallstreet	5	43800
	Pearl str.	.	. . . . . .	. . .	. . .			
					17		199	1743240
43.	Peck slip	.	. . . . . .	. . .	. . .	Frontstreet	1	8760
	Front str.	.	. . . . . .	. . .	23	Waterstreet	2	17520
	Beekm. str.	.	. . . . . .	. . .	. . .	Wallstreet	2	17520
	Water str.	.	. . . . . .	. . .	. . .	Pearlstreet	1	8760
					23	Cedarstreet	4	35040
51.	Peck slip	.	. . . . . .	. . .	. .		209	1830840
	South str.	.	. . . . . .	. . .	. .			
	Front str.	.	. . . . . .	. . .	15			
					15			
50	Fulton Market	16			85			
		16	35000	96	20			
		16		96	626			

Block	Street	Number of Kerosene lamps in B.	Would be consume of Gas average per Year in Cubicfeet.	Cubicfeet pr day	Horse powers
		16	35000	96	626
42	Beekm. str.	2			2
	Water str.	. .	. . . .	. . .	45
	Fulton str.	.	. . . .	. . .	. . .
	Front str.	8			15
		10	21000	60	62
34	Beekm. str.	4			35
	Pearl str.	8			. .
	Fulton str.	6			. .
	Water str.	4			. .
		22	48000	132	35
27	Beekm. str.	19			2½
	Clifford str.	9			40
	Pearl st.	7			42½
	Fulton str.	24			. . .
		59	130000	355	85
24	Beekm. str.	11			172
	Gold st.	.	. . . .	. . .	105
	Fulton str.	39			69½
	Cor. Fulton Cliff st.	20			. . .
		70	153000	420	346½
19	Beekm. str.	31			35
	William str.	5			16
	Ann str.	4			50
		40	88000	240	101
18.	Ann str.	23			44½
	William str.	8			10
	Fulton str.	22			8
	Gold str.	31			. . .
		79	173000	474	62½
9.	Beekm. str.	4			30
	Nassau str.	59			5
	Ann st.	135			105½
	William str.	57			12½
		255	558000	1530	153
		55	1207000	3300	1390½

Block	Street	Number of Kerosene Burners	Would be Consumed of Gas average per Year in Cubic feet	Cubic feet per day	Horse-power
		557	1207000	3307	1390½
8	Ann str:	19			22½
	Nassau str:	18			12½
	Fulton str:	29			82½
	William str.	18			28
		84	184000	504	145½
6.	Fulton str:	21			24
	Dutch str:	53			10
	John str:	20			3
	Nassau str.	116			
		210	460000	1260	37
7	Fulton st.	9			109
	John str:	4			35½
	Dutch str.	..			3
		13	28000	78	147½
17.	Fulton str	106			24
	Gold str:	77			108½
	John str:	15			24
	William str:	68			22½
		266	583000	1596	270
23.	Fulton str:	60			11
	Cliff str:	9			12
	John str:	4			—
	Gold str:	26			108
		99	217000	594	131
26	Fulton str:	48			—
	Pearl str.	41			2
	John str:	33			½
	Cliff str.	26			—
		148	324000	888	2½
33	Fulton str:	4			—
	Water str:	12			50
	Burling Slip	1			—
	Pearl str:	12			6.
		29	64000	174	56
		1400	3067000	8401	2142

Block	Street	Number of Kerosene Burners	Would be Consumed of Gas average per Year in Cubic feet	Cubic feet per day	Horse-power
		1400	3067000	8401	2142
41	Fulton str:	13			—
	Front str:	8			4
	Burling Slip	1			—
	Water str:	15			—
		37	81000	222	4
49	Fulton str:	24			
	South str:	...			
	Burling Slip	2			8
	Front str:	3			—
		29	64000	174	[illegible]
48.	Burling Slip	33			—
	Front str.	12			—
	Fletcher str	7			—
	South str:	20			—
		72	158000	432	—
47.	Front str.	21			—
	Maiden Lane	35			—
		56	123000	336	—
40.	Burling Slip	36			—
	Water str:	5			6
	Fletcher str:	—			—
	Front str:	11			—
		52	114000	312	6
39.	Water str.	2			—
	Maiden Lane	62			—
		64	140000	384	—
32.	Burling Slip	17			—
	Pearl str:	12			—
	Fletcher str.	2			—
	Water str:	14			—
		45	99000	270	—
31	Pearl str:	17			—
	Maiden Lane	17			—
	Water str:	7			—
		41	90000	246	—
		1786	3936000	10777	2163

Block	Street	Number of Consumers	Would be consume of Gas average per Year in Cubic feet	Cubic feet per Day	Horse power
		1795	3936000	10777	2163
22	Johnstr:	119			19
	Plattstr:	26			14
	Pearlstr:	8			—
		153	335000	918	23
~~21~~	~~Fletcher str~~	~~17~~			—
	~~Pearlstr:~~	~~12~~			—
	~~Fletcher str:~~	~~2~~			—
	~~Waterstr:~~	~~14~~			—
~~21~~	~~Pearlstr:~~	~~17~~			—
	~~Maiden Lane~~	~~17~~			—
	~~Waterstr:~~	~~6~~			—
21	Plattstr:	5			—
	Goldstr:	9			25
	Maidenlane	31			—
	Pearlstr:	21			—
		66	145000	396	25
16	Johnstr	25			79
	Williamstr:	15			—
	Goldstr:	10			12
		50	110000	300	43
15	Plattstr:	40			10
	Williamstr:	18			23
	Maidenlane	25			7
	Goldstr:	8			—
		91	199000	546	40
5	Johnstr:	93			121½
	Nassaustr:	50			—
	Maidenlane	58			44
	Williamstr:	20			20½
		221	484000	1326	186
4.	Maidenlane	78			12
	Libertystr:	41			—
	Nassaustr:	20	304000		—
		139		834	12
		[illegible]	5513000	15097	[illegible]

Block	Street	Number of Consumers	Would be consume of Gas average per Year in Cubic feet	Cubic feet per Day	Horse power
		2516	5513000	15097	2534
14	Maiden Lane	4			—
	Libertystr:	12			—
		16	35000	96	—
3	Libertystr:	84			25
	William str:	27			—
	Cedarstr:	71			27
	Nassaustr:	21			—
		203	445000	1218	52
13	William str:	33			—
	Maiden Lane	40			15
	Pearlstr:	18			—
	Cedarstr:	50			30
		141	309000	846	45
50	Maiden Lane	63			—
	Waterstr:	47			6
	Pinestr:	9			—
	Pearlstr:	35			90
		154	337000	924	96
65	Maiden Lane	13			—
	Frontstr:	31			—
	Depeysterstr:	8			—
		52	114000	312	—
44	Frontstr:	33			—
	Maidenlane	49			—
	Southstr:	12			—
	Depeysterstr:	12			—
		106	232000	631	—
37	Depeysterstr	13			6
	Frontstr:	10			—
	Pinestr:	7			—
		30	66000	181	6
30	Frontstr	25			33
	Waterstr:	7			—
	Wallstr:	27	129000		—
		59		354	33
		3277	7160000	19662	27[illegible]

Block	Street	Number of Kerosene Burners	Would be Consume of Gas average per Year in Cubic feet	Cubic feet per day	Horse power
		3277	7180000	19663	2786
45.	Vanpeyster str:	11			—
	Coenties str:	6			—
	Pinestr:	2			—
	Frontstr:	4			—
		23	50000	138	—
46	Pinestr:	7			—
	Frontstr:	13			24
	Wallstr:	53			—
	Southstr:	41			3
		114	250000	684	27
		3414	7480000	20485	2795

(The sum 7480000 found by multiplying the amount of the days with 365 and then arranged, therefore appears not 20493, but 20485).

2893

Block	Street	Number of Kerosene Burners	Would be Consume of Gas average per Year in Cubic feet	Cubic feet per day	Horse power
Continued 36	Frontstr:	18			
		18	39000	108	—
29	Waterstr:	23			—
	Pinestr:	18			—
	Pearlstr:	19			—
	Wallstr:	16			—
		76	166000	456	—
12	Pearlstr:	24			—
	Cedarstr:	64			—
	Williamstr:	18	232000		—
		106		636	—
		3614	7917000		
12	Corner Williamstr Pinestr				3 2 Elev: Waterpower
					245 (= 10) 18 Hoistways run by hand
11.	Corner Pearl and Pinestr:				50 Pinestreet: 1 Elev: probably steam; 4 Hoistways run by hand.
	Corner William and Pinestr:				10
					2966

Block	Street	Number of Kerosene Burners	Would be Consume of Gas average per Year in Cubic feet	Cubic feet per day	Horse power	
11	Wallstreet				18	2 Elev: steam, 1 probably steam
	"				28	
"	Pearlstreet					3 Elev: probably steam, 2 do Water, 1 Hoistway by hand.

71

Results of the before indicated Calculations of the books 1 – ~~17~~ 78 (~~2~~ 3 blocks yet not received).

Consume of Gas per Year in the Houses: ~~61 425000~~ 63.403000 Cub: F.

(3614 × 6 × 2½ × 365) reduced from the Kerosenelamps: ~~7 480000~~ 19.787000 " "

(209 × 5 × 12 × 365) by streetlamps: ~~2 440000~~ 4 577000

~~(199 Lamps × 2 Cubic feet per hour × 12 hours × 365 days)~~ ~~4 358000~~ ~~1.743000~~

Per Year 87 767000 C.F. — Per Year: ~~86 648000~~ C.F. ~~87 ...~~

Per day ~~241000~~ 240000 193556 C.F.

Number of Gasburners in the Houses: ~~15100~~ 15580 & $\frac{4}{2}$

" " " on the Streets: ~~199~~ 209

" " " reduced of the Kerosenelamps (~~3414~~), 1807

$\left(\frac{3614}{2}\right)$ 2 K.L. = 1 Gasburner: ~~1707~~

S^a 17596 & $\frac{4}{2}$ S^o ~~17400~~ 17406 & $\frac{4}{2}$

17598 = ~~17408~~ 17108 Lamps of large size.

1 Horsepower = 6 Lamps of large size:

$\frac{17108}{6} = 2851\frac{5}{6}$ = 2851 Horsepowers

Steamengines of 5 H.P. and below = 566 "

Total 3417 Horsepowers.

Per Horsepower Cubicfeet of Gas daily:

$\frac{\cancel{193556}\ 241000}{2851}$ = ~~68~~ 84 Cub: Feet of gas per Horsepower; that means, 1 H.P. is sufficient, to drive all lamps, which would light as long and as much, as do Gasburners. The average lighting time being 2,25 hours, therefore 11,3 Cub: F.

6 electric lamps = 1 Horsepower, = 1 electric lamp; the same Quotient, already obtained page 195 (4039 : 365 = 11,1).

1 Gasburner = 5 Cubicfeet:

$\frac{11,1}{5}$ = 2,25 = 37 cub. F. per hour equal to 1 Horsepower!

That is almost the theoretical effect.

Menlo Park 28. January 1881.

Hermann Claudius.

8.

Steamengines of 5 Horsepowers and below book 1–17:

$\frac{1}{2}$ H.P. ~~11~~ 12 = ~~5½~~ 6 H.P.
1 .. .. 57 = 57 .. ..
1½ .. .. 14 = 21 .. ..
2 .. .. 51 = 102 .. ..
2½ .. .. 10 = 25 .. ..
3 .. .. 42 = 126 .. ..
3½ .. .. 2 = 7 .. ..
4 .. .. 40 = 160 .. ..
4½ .. .. 5 = 22½ .. ..
5 .. .. 8 = 40
~~240~~ 566½ H.P.
241

Remark concerning the following tables:
There is entered but the number of burners, written by "numbers", not by "words"; in the books. The words" are but generally given notices and can be counted ~~to~~ ~~to~~ "the highest number of burners", but not to other "periods."

Block	Street	House	Number of Burners
10	Sprucestreet	2, 4, 6	2
	"	8	150
	"	12/14	8
			160
	Williamsstr.	179	6
	"	177	4
	"	175	2
	"	171	1
	Corn: William & Beekmanstreet		2
			15
	Beekmanstreet	36	2
	"	34	2
	"	32	8
	"	30	22
	"	28	8
	"	24	23
	"	20	3
	"	14	1
	Corner Nassau & Beekmanstreet		2
			71
	Nassaustreet	140	2
	"	142	5
	"	144	1
	"	146	1
	"	148	2
	"	146–148 150–152	25
	"	152	8
			44
20	Sprucestreet	26	1
	"	28-30	4
	"	34	4
	"	36	4
	Corner Sprucestr. & Goldstreet		2 ~~28~~
			15
			305

Block	Street	House	Number of Burners
	Corner Gold & Beekmanstr.		305
			6
			6
	Beekmanstreet	56	4
	"	54	4
	"	46	1
	"	44	10
	Corner Beekm: & Williamstreet		4
			23
	Williamstreet	176	2
	"	178	2
			4
25	C. Ferry and Goldstreet		3
	Ferrystreet	10	1
	"	26/28	1
	C. Ferry & Cliffordstreet		2
			7
	Cliffordstreet	67	2
	"	65	9
			11
	Beekmanstreet	88/90	12
	"	84	3
	"	82/84	14
	"	76	8
	"	74	10
	"	72	6
	"	70	8
	C. Gold & Beekmanstreet [illegible]		1
			62
28	Goldstreet	80	1
			1
	Corn: Ferry & Cliffordstreet		1
			1
	Pearlstreet	301	5
			5
			420

Block	Street	House	Number of Burners
			420
	Pearlstreet	293	1
	"	291	3
	C. Pearl & Beekm: Street		6
			15
	Beekmanstreet	96	2
	"	94	3
	"	92	2
	C: Beekman & Cliffordstreet		
			7
	Cliffordstreet	62	2
	"	70	1
			3
35	Waterstreet	236	3
	C. Beekm: & Waterstreet		6
			9
	Pearlstreet	294	2
	"	302	5
	"	304	2
	"	308	1
	"	310	3
	"	300	3
			10
43	Frontstreet	228/230	4
	"	226	2
			6
	C. Beekman & Waterstreet		6
			6
	Waterstreet	239/241	2
			2
51	Southstreet	112	1
	"	109	1
	"	108	1
	"	105	2
			5
	C. South & Beekmanstreet		1
			1
			490

Block	Street	House	Number of Burners
			490
50	C. Fultonmarket Beekm:		1
	C. " Frontstreet		1
	" " Fultonstreet		6
	" " Southstreet		2
	Fultonmarket	88/89	3
	2 C. Fultonmarket & Southstr:		2
	2 C. " Fultonstr:		1
	C. Fult. M. Beekm: & Fultonstr:		—
	C. Beekm. & Frontstr:		4
	" " " & Fulton M.		2
	" Frontstr: Fulton M.		13
	" " Fultonstr. "		4
	C. Fultonstr. Fulton M:		~~4~~
	C. Fulton & Southstr:		4
	Fultonmarket	241	2
	"	212	1
	"	214/216	—
	"	236	2
	"	233	1
	"	231	1
	"	224/226	3
	"	194/195	4
	"	163/165	5
	"	111–123	5
	"	125–127	8
	"	152/153	2
	"	166/167	3
	"	161/162	3
	"	132/135,160	3
	"	93/94	12
	"	117/118	2
	"	172	2
	"	176	1
	"	150/151	3
	"	177/178	5
	"	182/183	2
	"	184/185	4
	"	202/203	4
	"	186/187	4
			125
			490

Block	Street	House	Number of Burners
			490
			125
	Fultonmarket	188/189	1
	Fishmarket-Southstreet		48
	Oppos: Fult M. Southstr. Side		56
	Corn: Beekman & Frontstr:		1
			106
42	Beekmanstr.	123	8
			8
	Waterstreet	213/215	2
			2
	Fultonstreet	19	7
	C. Pearlstreet & Beekm: Str.		16
			23
	Pearlstreet	280	1
	"	278	2
	"	274	1
	"	272	24
	C. Fulton & Pearlstreet		4
			32
	~~33/4~~		
	Fultonstreet	33/34	1
	"	31	3
	C. Fultonstr: Waterstr:		8
			12
	Waterstreet	206	5
			5
27	C. Beekm: & Cliff. Str:		1
			1
	Cliffordstreet	48	2
	"	53	4
	"	47	7
	C. Fulton & Pearlstr:		6
			19
	Fultonstreet	41	2
			2
	C. Fulton & Pearlstreet		5
			5
	Pearlstreet	271	1
			1
			705

Block	Street	House	Number of Burners
			705
	Pearlstreet	273	4
	"	279	1
	"	283	3
			9
24	Beekmanstreet	87/89	4
	"	85	1
	"	83	2
	"	81	3
	"	79	2
	"	77	11
	"	75	1
	"	73	1
	C. Beekm: & Fultonstr:		18
	Beekmanstr:	67/69	1
	C. Beekm: & Goldstr.	65	1
			45
	Goldstreet	64	1
	"	62/64	1
	"	56/58	1
	1. C. Gold & Fultonstreet		10
			13
	~~2. C. Gold & Fultonstreet~~		10
	Fultonstreet	69	4
	"	63	1
	"	61	3
	"	59	5
	"	57	4
			27
19.	Beekmann	59	16
	"	57	1
	"	55	5
	"	53	4
	"	51	2
	"	49	3
	"	47	2
	"	45	4
	C. Beekm: & Williamstr:		16
			43
			542

Block	Street	House	Number of Burners
			842
	Williamstreet	164	6
	"	162	3
	"	160	9
	"	158	5
	C. William & Annstr:		15
			38
	Annstreet	79	6
			6
	Beekmannstr:	59	2
			2
18.	Annstreet	86	2
	C. Fulton & Annstreet		35
			37
	C. Ann & Williamstreet		2
	Williamstreet	152	4
	"	150	4
	"	148	4
	"	146/148	2
			10
	C: William & Fultonstr:		5
	Fultonstreet	97	10
	"	95	2
	"	87	9
	"	85	1
			27
	C. Fulton & Goldstr:		2
			2
9	C. Beekm: & Williamstr:		1
	Beekmannstr:	33	5
	"	31	19
	"	29	3
			28
			970

Block	Street	House	Number of Burners
			970
			28
	Beekmanstr:	27	7
	"	25	3
	"	23	12
	"	21	6
	"	19	6
	"	15/17	35
	C. Nassau & Beekm: Str:		1
			98
	Nassaustr:	132	1
	"	124/126	1
	"	122	4
	"	120	8
	"	116	3
	"	118	2
	"	114	3
			22
	C. Nassau & Annstr:		1
	Annstreet	39	1
	"	39/41	1
	"	41	4
	"	43	1
	"	45	1
	"	49	2
	"	51	3
	"	53	4
	"	55	1
	"	57	4
	"	rear 59	2
	"	59	3
	"	57/59	3
	C. Ann & Williamstr:		3
			34
	Williamstr: Hotel		7
			7
			1124

Block	Street	House	Number of Burners
			1124
			7
	Williamstreet	163	3
	"	167	5
	C. William & Annstr:		2
			17
8	Annstreet	62	2
	"	60	6
	1. C. Ann & Fultonstr.		18
	2. " " "	54/115	12
	" "	52/117	4
	Annstreet	50	6
	"	48	2
	"	46	1
	Ann & Fultonstr:	42/117	6
	Annstreet	42	1
	C. Annstr. & Nassaustr:		10
			68
	Nassaustreet	102	2
	C. Ann & Nassaustr:		14
	Nassaustreet	100	9
	"	98	4
	C. Nassau & Fultonstr.	~~40~~	41
			70
	Fultonstreet	125	26
	"	123	6
	"	119	2
	"	117	8
	"	109	4
	"	105	3
	C. William & Fultonstr:		33
			82
	Williamstreet	149	5
	"	139	3
			8
			1361

Block	Street	House	Number of Burners
			1361
			8
	Williamstreet	135/137	5
	"	133	4
	"	131	13
	"	127/129	6
	"	123	1
	"	119/121	12
	Corn: of John and "	115/117	13
			62
6.	C. Fulton & Nassaustr:		4
	Fultonstr.	124	3
	"	122	15
	"	120	8
	"	118	18
	"	116	21
	"	114	27
	C. Fulton & Dutchstr.		6
			102
	Dutchstreet	17	2
	"	15	3
	"	9/11/13	8
	"	5	3
	C. Dutchstr. & Johnstreet		11
			27
	Johnstreet	47	4
	"	45	1
	"	43	2
	"	41	19
	"	39	7
	"	37	4
	"	35	4
	C. Nassaustr: & Johnstr:		7
	Johnstreet	33	2
			50
			1602

Ward	Street	House	Number of Nurses
			1602
	Nassaustreet	74	1
	"	76	2
	"	78	1
	"	80	2
	"	84	14
	"	86	9
	"	88	3
			32
7	C. Dutch & Fultonstreet		6
	Fultonstreet	110	1
	"	106/108	40
	"	104	25
	"	102	8
	"	100	3
			82
	C. John & Williamstreet		8
	Johnstreet		15
	C. John & Dutchstreet		21
			44
	Dutchstreet	12	6
	"	16	2
			8
17	C. William & Fultonstreet		9
	Fultonstreet	96	1
	"	94	7
	"	92	10
	"	90	9
			36
	Goldstreet	45	3
	"	43	1
			4
			1804

Ward	Street	House	Number of Nurses
			1804
			4
	Goldstreet	33	1
	"	29/31	1
	C. Gold & Johnstreet		2
			8
	Johnstreet	83	2
	"	79	22
	"	77	16
	"	75	1
	"	71	4
	C. John & Williamstreet		2
			47
	Williamstreet	116	3
	"	118	1
	"	126	2
	"	128	1
	"	130	2
	"	134/136	15
	"	138	6
			30
23	Fultonstreet	76	1
	"	74	1
	"	70/76	30
	Ryders Alley-Goldstr.	48	1
	C. Ryders Alley-Fultonstr.		4
	Fultonstreet	66/68	1
	"	64	9
	"	62	3
	"	60	1
	"	58	4
	"	58/60	4
	C. Fulton & Cliff str.		8
			67
			1956

Ward	Street	House	Number of Nurses
			1956
	Cliffstreet	27	12
	"	25	6
	"	23	8
	"	21	2
	"	19	4
	"	11	8
	"	11/13	4
	"	7/9	20
			64
	~~C. Johnstreet & Cliffstr.~~		
	C. Johnstr. & Cliff	100	11
	Johnstreet	95	1
	"	93	2
			14
	Goldstreet	30	1
	"	38	2
	"	40/42	2
	"	44	1
			6
26	Fultonstreet	50	2
	"	46	1
	"	44	2
	C. Fulton & Pearlstreet		7
	Fultonstreet	40	3
			15
	Pearlstreet	257	5
	"	255	2
	"	251	14
	"	245	2
	"	243	4
	C. Pearl & Johnstreet		1
	Johnstreet	113	2
			30
			2085

Ward	Street	House	Number of Nurses
			2085
	Cliffstreet	18	3
	"	24	1
	"	26	3
	"	28	2
	"	32	1
	"	~~30~~	
			10
33	C. Fulton & Pearlstreet		3
	Fultonstreet	36	1
	C. Fulton & Waterstreet		1
			5
	C. Pearl-Fulton & Waterstreet		20
	Waterstreet	194	2
	"	186/190	6
			28
	Pearlstreet	242	4
	"	244	2
	"	246	1
	"	254	14
	"	258/260	36
	"	262	7
			64
41	Fultonstreet	22	1
	C. Fulton & Frontstreet		2
	Frontstreet	198	1
	"	194	2
	"	192	2
	"	186	3
			11
	Burling Slip	17	1
			1
			2204

Block	Street	House	Number of Burners
			2204
	Waterstreet	185/187	1
	"	197	1
			2
49	C. Fulton & Frontstreet		10
	Fultonstreet	12	1
	"	10	6
	"	204/206	20
	C. Fulton & Pearl Str.		5
			42
	Southstreet	92	3
	"	91	4
	"	90	1
			8
	Burling Slip	31/35	6
	"	29	1
	C. Frontstr. & Burling Sl.		1
			8
	~~Frontstr.~~		
	Frontstreet	189/191	2
			2
48	C. Southstr. & Burling Slip		2
	Burling Slip	32	5
			7
	C. Front & Fletcherstr.		4
			4
	Southstreet	76	1
	C. Southstr. & Fletcherstr.		4
	Southstreet	83	4
	"	85	2
			11
			2277

Block	Street	House	Number of Burners
			2277
			11
	Southstreet	86	1
			12
47	C. Maidenlane & Southstr.		2
			2
40	C. Burling Slip & Waterstr.		2
			2
	Waterstreet	177	2
	"	173	1
	"	171	1
			4
	Fletcherstreet	22	1
			1
39	C. Waterstr. & Maidenlane		1
			1
	Maidenlane	137	1
	C. Frontstr. & Maidenlane		1
			2
32	Pearlstreet	226	1
	"	222	1
	"	220	1
	"	218	2
	"	216	1
	"	214	12
			18
	Fletcherstr.	4	2
			2
			2321

Block	Street	House	Number of Burners
			2321
	Waterstreet	166	3
	"	178	1
			4
31	Fletcher & Pearlstr.		1
			1
	Maidenlane	129	2
	C. Maidenlane & Waterstr.		1
			3
22	Johnstreet	108	1
	"	104/106	4
	"	104	3
	C. John & Plattstreet		4
	Johnstreet	98	3
	"	96	2
	"	94	3
	C. John & Goldstreet		1
			21
	C. Gold & Plattstreet		4
	Plattstreet	13	1
	"	3	1
	C. Platt & Pearlstreet		2
			8
	Pearlstreet	227	1
	"	231	2
			3
21	C. Platt & Pearlstr.		4
	Plattstr.	8/10	3
			7
			2361

Block	Street	House	Number of Burners
			2361
			7
	Plattstreet	12	1
	"	14	1
			9
	Goldstreet	7,8,10	25
	"	8	2
			27
	Maidenlane	97	5
			5
	Pearlstreet	203	5
	"	209	3
	"	215	2
	"	~~217~~	
			10
16	Johnstreet	86	2
	"	84	7
	"	82	2
	"	80	2
	"	78	3
	"	76	8
	"	74	2
	"	72	1
			27
	Williamstreet	106	4
	"	104	6
	"	102	1
	"	98	1
			12
	Goldstreet	21	1
			1
15	C. Platt & Goldstreet		2
			2
			2452

Block	Street	House	Number of Burners
			2452
			2
	Plattstreet	28	1
			3
	Williamstr:	90	2
	"	88	2
	"	86	1
	C. Williamstr: Maidenlane		2
			7
	Maidenlane	67	1
	"	73	1
	"	81	3
	"	83	1
			6
	Goldstreet	9	6
	"	13	1
	C. William - Johnstreet		5
			12
5.	Johnstreet	64	4
	C. John Williamstreet		3
	Johnstreet	62	4
	"	60	3
	"	58	3
	"	56	6
	"	50	12
	"	48	1
	"	42	9
	"	36	2
	"	34	5
	C. Nassau & Johnstreet		3
			55
			2535

Block	Street	House	Number of Burners
			2535
	Nassaustreet	68	5
	"	66	7
	"	64	3
	"	62	7
	C. Maidenlane & Nassaustr:		13
			35
	Maidenlane	31	16
	"	33	6
	"	35	11
	"	37	12
	"	39	17
	"	41	10
	"	43	10
	"	45	6
	"	47	4
	"	49	5
	"	51	14
	"	53	1
	"	55	3
	"	57	10
	"	59	7
	"	59/61	5
	"	61	4
	"	63	9
			150
	Williamstreet	87	2
	"	93	1
	"	95	6
	"	99/101	4
	"	99	7
	"	103/101	1
			21
			2741

Block	Street	House	Number of Burners
			2741
4.	C. Maidenlane & Nassaustr:		5
	Maidenlane	30	1
	"	32	2
	"	36	6
	"	38	2
	"	40	3
	"	42	2
	"	44	4
	"	44½	4
	"	46	12
	"	48	13
	"	50	5
	"	52	2
	"	54	8
	"	56	1
	"	60	1
	C. Maidenlane & Williamstr:		7
			78
	C. Liberty & Williamstr:		10
	Libertystr:	31	1
	"	39	2
	"	41	1
	"	43	10
	"	47/49	12
	"	51	4
	C. Nassau - Libertystr:		1
	Nassaustr:	42/46	1
	"	42	3
	"	48/50	2
	"	50	4
			51
			2870

Block	Street	House	Number of Burners
			2870
14.	C. Maidenlane, Will: Libertystr:		12
			12
	Maidenlane	70	2
	"	74	7
	C. Maidenlane Libertystr:		3
			12
3.	C. Nassau - Libertystr:		1
	C. Liberty, Nassau, Cedarstr:		6
			7
	Libertystr:	36	2
	"	30	4
	"	24	12
	"	20	2
	Liberty - Williamstr:		2
			22
	Williamstr:	75	4
	"	73	8
	"	71	1
	C. William - Cedarstr:		2
			15
	Cedarstreet	45	3
	"	47	8
	"	51	4
	"	55	9
	"	57	10
	"	59	6
	"	61	6
			46
13.	Maidenlane	86	3
			3
			2984

Block	Street	House	Number of Burners
			2984
	Maidenlane	88	40
	"	90/94	4
	"	102	2
	C. Mc Lane & Pearlstr:		9
			58
	Cedarstreet	3	2
	"	17	8
	C. William & Cedarstr		14
			24
	Williamstreet	72	4
	"	74	6
	"	76	2
			12
30	C. Maidenlane & Pearlstr:		1
			1
	Waterstreet	136	16
			16
	Pearlstreet	174/176	8
	"	184/186	16
	"	188	8
	"	192	6
			38
38	Frontstreet	152	1
	"	146	2
			3
44	Frontstreet	145	1
	"	151	1
			2
	C. Frontstr. & Wallstr.		2
			2
			3138

Block	Street	House	Number of Burners
			3138
37	~~C. Depeyster & Pinestr.~~		~~15~~
	Maidenlane	166	2
	"	168	2
			6
	Southstr:	73/74	1
	~~C. Depeyster & Southstr.~~		1
	Depeysterstr.	31	1
	C. Depeyster & Frontstr.		1
			2
	Frontstr:	141	1
	"	143	2
			3
37	C. Depeyster & Pinestr:		15
			15
36	C. Water & Pinestr:		9
			9
	Frontstreet	132	2
	C. Pinestreet & Frontstr:		2
			4
	Waterstreet	133	1
	"	133	1
	"	127/129	9
	"	127	1
	"	123/125	13
	"	121	16
	C. Wallstr. & Waterstr:		6
			47
	Wallstreet	92	2
	"	96	2
	"	102/104	2
			6
			3231

Block	Street	House	Number of Burners
			3231
	C. Front & Wallstreet: (Continuation in Block 18 yet not calculated).		3
			3
45	C. South & Pinestreet		3
			3
	Pinestreet	90	6
			6
	C. Front & Pinestreet		3
	Frontstreet	135	3
			6
46	Pinestreet	95	1
	C. Front & Pinestr:		1
			2
	Frontstreet	129	2
	"	125/127	12
	"	121/123	12
	"	119	3
		~~117~~	29
	Wallstreet	108	3
	"	110	1
	"	112	2
	"	114	5
	"	116	2
	"	118	2
	C. South & Wallstreet		1
			16
	Southstreet	61	2
	"	62	1
	"	65	1
			4
			3296

Block	Street	House	Number of Burners
			3296
	Southstreet	66	1
	"	67	4
			9
			3305
36 Contin:	Frontstreet		23
29	Waterstreet		21
	Pinestreet		7
	Pearlstreet		18
	Wallstreet		20
12	Cedarstreet		6
	Williamstreet		7

Hoistways and Elevators:

Hoistways: 553 driven by Hand etc:
1 " " Steam
57 " " " probably.
Sa 611

Elevators: 13 driven by Water etc:
32 " " Steam
9 " " " probably
Sa 54.

Blanks 1, 2, 11 yet not received.

1 Hoistway = 7 Lamps = 1 Hpower.
1 Elevator = 35 " = 5 " "

Average paid per month for Gas, arrounded on half or full Dollars:

Block 10.

2 à	½ $
3 "	1 "
4 "	1½ "
5 "	2 "
2 "	2½ "
4 "	3 "
3 "	3½ "
2 "	4 "
3 "	5 "
1 "	6 "
3 "	7 "
1 "	10
2 "	12
2 "	18
1 "	20
1 "	21
1 "	22
1 "	25
1 "	28
2 "	30
1 "	55
1 "	80
1 "	200
50	

Block 20.

1 à	½ $
8 "	1 "
3 "	1½ "
5 "	2 "
3 "	2½ "
1 "	3 "
2 "	3½ "
1 "	5 "
2 "	6 "
1 "	7 "
3 "	8 "
1 "	10 "
1 "	12 "
1 "	25 "
1 "	200
34	

Block 25

2 à	½ $
4 "	1 "
4 "	1½ "
1 "	2 "
2 "	2½ "
1 "	3 "
1 "	3½ "
3 "	4 "
1 "	5 "
1 "	6 "
1 "	7 "
1 "	8 "
2 "	9 "
3 "	11 "
1 "	12 "
1 "	15
1 "	20
1 "	25
1 "	50
1 "	75
33	

Block 28

1 à	½ $
1 "	1 "
1 "	2 "
1 "	2½ "
2 "	4 "
2 "	5 "
1 "	5½ "
1 "	6 "
2 "	7 "
2 "	7½ "
2 "	9 "
1 "	13½ "
1 "	14½ "
1 "	35½ "
19	

Block 35.

3 à ½ $
4 " 1 "
2 " 1½ "
5 " 2 "
1 " 2½ "
1 " 3 "
2 " 4 "
1 " 6½ "
2 " 8 "
1 " 9 "
3 " 10 "
1 " 11 "
2 " 12 "
1 " 14½ "

29

Block 43.

3 à ½ $
7 " 1 "
1 " 1½ "
2 " 2 "
2 " 2½ "
2 " 3 "
2 " 4 "
1 " 5 "
2 " 8 "
1 " 11 "
1 " 15 "
1 " 21

25

Block 51.

1 à ½ $
2 " 1½ "
1 " 4 "
3 " 5 "
1 " 6 "
1 " 7 "
1 " 9 "
2 " 11 "
1 " 12 "
1 " 15 "
1 " 16½ "
1 " 38 "
1 " 43½ "
1 " 49 "

18

Block 50.

1 à ½ $
3 " 1 "
5 " 1½ "
7 " 2 "
7 " 2½ "
21 " 3 "
2 " 3½ "
6 " 4 "
6 " 4½ "
3 " 5 "
2 " 5½ "
3 " 6 "
1 " 7 "
3 " 9 "
1 " 10 "
1 " 12 "
1 " 15 "
1 " 16 "
1 " 18½ "
1 " 26½ "
1 " 35 "
1 " 45 "
1 " 50 "
1 " 80 "
1 " 154½ "

81

Block 42.

1 à ½ $
2 " 1 "
2 " 2 "
2 " 2½ "
1 " 4 "
1 " 4½ "
1 " 6 "
1 " 9 "
1 " 13½ "
1 " 15 "
1 " 15½ "
1 " 16½ "
1 " 180 "

16

Block 34.

2 à 1 $
3 " 1½ "
4 " 2 "
3 " 2½ "
2 " 4 "
2 " 4½ "
1 à 5½ "
1 à 6½ "
1 " 10 "
1 à 15½ "
1 à 17 "
2 à 21 "
1 " 28 "
1 " 123 "

25

Block 27.

3 à ½ $
6 " 1 "
3 " 1½ "
2 " 2 "
1 " 2½ "
1 " 3 "
1 " 3½ "
2 " 4 "
3 " 4½ "
4 " 5 "
3 " 5½ "
1 " 9½ "
1 " 10 "
1 " 12½ "
1 " 13 "
1 " 13½ "
1 " 17½ "
1 " 23 "
1 " 25 "
1 " 47 "

38

Block 24.

3 à ½ $
4 " 1 "
1 " 1½ "
3 " 2 "
1 " 2½ "
5 " 3 "
1 " 3½ "
5 " 4 "
1 " 4½ "
3 " 5 "
4 " 5½ "
1 " 6 "
2 " 8 "
1 " 9 "
3 " 10 "
3 " 10½ "
1 " 11½ "
1 " 12 "
1 " 14 "
1 " 15 "
2 " 16 "
2 " 18 "
1 " 30 "
1 " 40 "
1 " 54½ "
1 " 72½ "

53

Block 19.
5 à 1 $
2 „ 1½ „
1 „ 2½ „
6 „ 3 „
1 „ 3½ „
1 „ 4 „
2 „ 4½ „
3 „ 5 „
2 „ 5½ „
1 „ 9 „
3 „ 9½ „
1 „ 14½ „
1 „ 20 „
1 „ 26½ „
2 „ 50 „
1 „ 56½ „
33

Block 18.
4 à 1 $
2 „ 1½ „
4 „ 2 „
1 „ 2½ „
3 „ 4 „
1 „ 4½ „
1 „ 5½ „
1 „ 6 „
2 „ 6½ „
1 „ 7 „
1 „ 12 „
1 „ 12½ „
1 „ 13 „
1 „ 15½ „
2 „ 16½ „
1 „ 200
27

Block 9.
2 à ½ $
11 „ 1 „
6 „ 1½ „
8 „ 2 „
4 „ 2½ „
8 „ 3 „
3 „ 3½ „
2 „ 4 „
3 „ 4½ „
1 „ 5 „
3 „ 5½ „
2 „ 7 „
2 „ 7½ „
2 „ 8 „
4 „ 9 „
2 „ 10½ „
1 „ 15 „
1 „ 19 „
1 „ 23 „
1 „ 25 „
1 „ 38 „
1 „ 51½
69

Block 8
1 à ½ $
6 à 1 „
4 „ 1½ „
1 „ 2 „
2 „ 2½ „
4 „ 3 „
1 „ 3½ „
2 „ 4 „
2 „ 4½ „
4 „ 5 „
1 „ 6 „
1 „ 7 „
2 „ 7½ „
2 „ 8 „
1 „ 8½ „
1 „ 9 „
3 „ 9½ „
2 „ 10 „
1 „ 10½ „
2 „ 13 „
1 „ 13½ „
1 „ 15 „
2 „ 16 „
1 „ 18 „
1 „ 19 „
1 „ 20 „
1 „ 22 „
1 „ 22½ „
1 „ 25
~~13~~
1 „ 31½
1 „ 33½
1 „ 34
1 „ 37½
1 „ 40½
1 „ 53
1 „ 58
66

Block 6.
4 à ½ $
8 „ 1 „
2 „ 1½ „
5 „ 2 „
4 „ 2½ „
4 „ 3 „
4 „ 3½ „
3 „ 4 „
2 „ 4½ „
1 „ 5 „
3 „ 5½ „
5 „ 6 „
1 „ 6½ „
1 „ 7 „
1 „ 7½ „
6 „ 8 „
2 „ 8½ „
1 „ 9 „
1 „ 9½ „
2 „ 10 „
1 „ 11 „
2 „ 11½ „
1 „ 12½ „
2 „ 13 „
1 „ 16 „
1 „ 20½ „
2 „ 23 „
1 „ 25 „
1 „ 26½ „
1 „ 53 „
1 „ 54 „
1 „ 62½ „
75

Block 7.
1 à ½ $
3 „ 1 „
1 „ 1½ „
2 „ 2½ „
1 „ 3 „
1 „ 3½ „
2 „ 4 „
1 „ 4½ „
1 „ 11 „
2 „ 15½ „
1 à 25 „
1 „ 28 „
1 à 31½ „
1 à 33½ „
1 à 53½ „
20

Block 17.
5 à ½ $
9 „ 1 „
8 „ 1½ „
5 „ 2 „
3 à 2½ „
7 „ 3 „
3 „ 3½ „
3 „ 4 „
5 „ 4½ „
2 „ 5½ „
2 „ 6 „
4 „ 7
3 „ 8 „
1 „ 8½ „
1 „ 10 „
3 „ 10½ „
1 „ 15½ „
1 „ 19 „
1 „ 27 „
1 „ 67 „
70

23
Block 2
3 à ½ $
5 „ 1 „
6 „ 1½ „
2 „ 2 „
2 „ 2½ „
4 „ 3 „
1 „ 3½ „
3 „ 4 „
1 „ 4½ „
2 „ 5 „
2 „ 6 „
7 „ 6½ „
1 „ 8 „
1 „ 8½ „
2 „ 9½ „
1 „ 10 „
1 „ 10½ „
2 „ 11½ „
7 „ 13½ „
1 „ 14½ „
1 „ 16 „
2 „ 16½ „
1 „ 19 „
2 „ 23 „
1 „ 24 „
1 „ 27 „
55

Block 26.

8 à ½ $
4 " 1 "
4 " 1½ "
2 " 2 "
3 " 2½ "
1 " 3 "
1 " 3½ "
6 " 4 "
1 " 4½ "
3 " 5½ "
2 " 7 "
2 " 8 "
1 " 8½ "
1 " 14½ "
1 " 16 "
1 " 19 "
1 " 24½ "
42

Block 33

2 à ½ $
3 " 1 "
1 " 1½ "
1 " 2 "
1 " 2½ "
2 " 3 "
1 " 4 "
1 " 4½ "
1 " 5 "
1 " 8½ "
1 " 9½ "
1 " 16½ "
1 " 17½ "
1 " 19 "
1 " 28½ "
1 " 78 "
1 " 104½
21

Block 41.

1 à ½ $
3 " 1 "
3 " 1½ "
2 " 2 "
2 " 2½ "
1 " 4 "
2 " 4½ "
1 " 5½ "
1 " 7 "
1 " 8 "
1 " 12½ "
18

Block 49.

1 à 1 $
4 " 1½ "
3 " 2 "
1 " 2½ "
1 " 3 "
1 " 6 "
1 " 6½ "
1 " 7½ "
1 " 8½ "
1 " 9½ "
1 " 12½ "
1 " 19 "
1 " 22 "
1 " 29½ "
1 " 49½ "
20

Block 48.

3 à ½ $
4 " 1 "
3 " 1½ "
2 " 2½ "
1 " 4 "
1 " 4½ "
1 " 7 "
1 " 8 "
1 " 9½ "
2 " 10 "
1 " 12½ "
20

Block 47.

4 à 1 $
1 à 21½ "
5

Block 40.

4 à ½ $
6 " 1 "
6 à 1½ "
2 " 2 "
2 " 2½ "
1 " 4 "
21

Block 39.

1 à 1 $
1 à 1½ "
1 " 2 "
1 " 2½ "
1 " 4 "
1 " 5½ "
6

Block 32.

1 à 1/2 $
4 „ 1 „
4 „ 1 1/2 „
1 „ 2 „
1 „ 2 1/2 „
2 „ 4 „
1 „ 7 „
1 „ 12 1/2 „
1 „ 50 „
26

Block 31.

1 à 1/2 $
2 „ 1 „
1 „ 1 1/2 „
2 „ 2 1/2 „
1 „ 4 1/2 „
1 „ 5 „
1 „ 6 „
9

Block 22.

3 à 1/2 $
5 „ 1 „
3 „ 1 1/2 „
5 „ 2 „
2 „ 2 1/2 „
1 „ 3 „
1 „ 4 „
1 „ 5 1/2 „
3 „ 6 „
1 „ 8 1/2 „
3 „ 9 1/2 „
1 „ 12 „
1 „ 20 1/2 „
30

Block 21.

12 à 1/2 $
6 „ 1 „
6 „ 1 1/2 „
4 „ 2 „
2 „ 2 1/2 „
1 „ 3 „
5 „ 3 1/2 „
1 „ 4 „
3 „ 4 1/2 „
3 „ 5 1/2 „
1 „ 13 1/2 „
1 „ 77 „
45

Block 16.

2 à 1 $
2 „ 1 1/2 „
4 „ 2 „
[illegible] „ 2 1/2 „
[illegible] „ 3 „
1 „ 3 1/2 „
3 „ 4 „
1 „ 4 1/2 „
1 „ 5 „
1 „ 5 1/2 „
1 „ 6 „
1 „ 7 1/2 „
1 „ 10
1 „ 11 1/2
1 „ 16 1/2
1 „ 20
25

Block 15.

1 à 1/2 $
4 „ 1 „
4 „ 1 1/2 „
1 „ 2 „
5 „ 2 1/2 „
3 „ 3 1/2 „
1 „ 5 „
2 „ 5 1/2 „
1 „ 6 „
1 „ 7 „
2 „ 8 1/2 „
1 „ 9 1/2 „
1 „ 11 1/2 „
1 „ 12 „
1 „ 17 „
26

Block 5.

3 à 1/2 $
8 „ 1 „
10 „ 1 1/2 „
15 „ 2 „
5 „ 2 1/2 „
10 „ 3 „
3 „ 3 1/2 „
9 „ 4 „
5 „ 4 1/2 „
2 „ 5 „
3 „ 5 1/2 „
10 „ 6 „
3 „ 7 „
2 „ 7 1/2 „
5 „ 8 „
1 „ 8 1/2 „
1 „ 9 „
2 „ 9 1/2 „
4 „ 10 1/2 „
1 „ 11 „
1 „ 12 1/2 „
1 „ 13 „
1 „ 13 1/2 „
117

117
1 à 14 1/2 $
1 „ 15 „
3 „ 15 1/2 „
1 „ 17 1/2 „
2 „ 22 „
1 „ 25 „
1 „ 29 1/2 „
127

Block 4.

1 à 1/2 $
8 „ 1 „
12 „ 1 1/2 „
9 „ 2 „
7 „ 2 1/2 „
3 „ 3
1 „ 3 1/2 „
3 „ 4 „
2 „ 4 1/2 „
1 „ 5 1/2 „
5 „ 6 „
2 „ 7 „
2 „ 7 1/2 „
1 „ 8 1/2 „
1 „ 9 „
1 „ 9 1/2 „
1 „ 10 „
2 „ 10 1/2 „
2 „ 12 „
2 „ 12 1/2 „
1 „ 14 1/2
1 „ 15 1/2
1 „ 16 1/2
4 „ 19
1 „ 23
1 „ 26
76

Block 14.

1 à 1/2 $
2 " 1 "
1 " 1 1/2 "
1 " 2 1/2 "
1 à 5 1/2 "
[illegible] " (1 à 8)
2 " 14 1/2 "
1 " 16 "

6

Block 3.

1 à 1/2 $
2 " 1 "
1 " 1 1/2 "
6 " 2 "
4 " 2 1/2 "
1 " 3 "
3 " 3 1/2 "
7 " 4 "
1 " 4 1/2 "
1 " 5 "
1 " 5 1/2 "
1 " 6 "
1 " 7 1/2 "
1 " 8 "
2 " 8 1/2 "
1 " 9 1/2 "
1 " 13 "
1 " 14 1/2 "
1 " 15 "
1 " 16 1/2 "
1 " 17 "
2 " 21 "
1 " 27 "
1 " 41 1/2 "

43

Block 13.

6 à 1/2 $
6 " 1 "
3 " 1 1/2 "
3 " 2 "
5 " 2 1/2 "
3 " 3 "
2 " 3 1/2 "
4 " 4 "
1 " 4 1/2 "
1 " 5 "
2 " 5 1/2 "
1 " 6 "
2 " 8 "
1 " 8 1/2 "
1 " 9 "
2 " 10 1/2 "
1 " 12 1/2 "
1 " 15 "
1 " 16 1/2 "
1 " 39 "
1 " 125 "

48

Block 30.

3 à 1/2 $
7 " 1 "
3 " 1 1/2 "
2 " 2 "
2 " 5 1/2 "
1 " 7 "
1 " 11 "
1 " 12 "
1 " 15 1/2 "
1 " 21 "

22

Block 38.

2 à 1 $
2 " 1 1/2 "
1 " 2 1/2 "
1 " 3 "

6

Block 44.

2 à 1/2 $
1 " 1 "
5 " 1 1/2 "
2 " 3 "
2 " 4 "
1 " 6 "
2 " 8 1/2 "
1 " 12 1/2 "

16

Block 37.

1 à 27 $

Block 17.

3 à 1/2 $
9 " 1 "
11 " 1 1/2 "
1 " 2 "
2 " 2 1/2 "
1 " 3 "
1 " 3 1/2 "
2 " 4 "
1 " 4 1/2 "
1 " 5 1/2 "
2 " 8 1/2 "
1 " 9 1/2 "
1 " 10 "
1 " 14 1/2 "
1 " 15 1/2 "
1 " 93 "

39

Block 45.

3 à 1$
3 „ 4½ „
1 „ 9 „
1 „ 16½ „
8

Block 46.

9 à ½$ 10½
6 „ 1 „ 211
12 „ 1½ „ 106
4 „ 2½ „
3 „ 3 „
1 „ 3½ „
3 „ 4 „
1 „ 4½ „
1 „ 5 „
1 „ 5½ „
4 „ 6 „
1 „ 7 „
1 „ 7½ „
1 „ 8½ „
1 „ 9 „
1 „ 9½ „
1 „ 11 „
1 „ 39 „
52

Block 36 Centre:

2 à ½$
4 „ 1 „
4 „ 1½ „
2 „ 2 „
1 „ 2½ „
1 „ 4½ „
1 „ 6 „
1 „ 7 „
1 „ 14 „
17

Block 29.

8 à ½$
6 „ 1 „
5 „ 1½ „
5 „ 2 „
1 „ 2½ „
1 „ 3 „
3 „ 3½ „
1 „ 4½ „
1 „ 6 „
1 „ 6½ „
1 „ 7 „
1 „ 7½ „
1 „ 8 „
1 „ 10 „
2 „ 14 „
1 „ 19 „
1 „ 31 „
1 „ 51½ „
41

Block 12.

3 à 1½$
5 „ 1 „
4 „ 1½ „
2 „ 2 „
4 „ 2½ „
1 „ 3½ „
2 „ 4 „
1 „ 5½ „
22

Number of Burners in Winter

Block	Street	6-7	7-8	8-9
10	Sprucestreet	163	153	3
	Williamstreet	13	18	20
	Beekmanstreet	65	61	46
	Nassaustreet	15	16	15
		256	248	84
20	Sprucestreet	6	6	6
	Goldstreet	4	4	4
	Beekmanstreet	1	1	1
	Williamstreet	5	5	5
		16	16	16
25	Ferrystreet	2	2	2
	Beekmanstreet	32	20	20
	Goldstreet	—	—	—
		34	22	22
28	Ferrystreet	15	15	15
	Pearlstreet	9	11	11
	Beekmanstreet	—	—	—
	Cliffordstreet	5	5	5
		29	31	31
35	Peckslip	—	—	—
	Waterstreet	—	—	—
	Beekmanstreet	3	9	9
	Pearlstreet	19	19	2
		22	28	11
43	Peckslip	1	7	1
	Frontstreet	11	11	—
	Beekmanstreet	1	4	—
	Waterstreet	—	—	
		13	22	1
51	Peckslip	12	17	17
	Southstreet	78	78	59
		90	95	76

Block	Street	6-7	7-8	8-9
		90	[illegible]	[illegible]
	Beekmanstr.	—	—	—
	Frontstr.	12	12	12
		102	107	88
50	Fulton Mt.	325	215	211
		325	215	211
42.	Beekm: Str.	19	16	16
	Waterstreet	11	11	11
	Fultonstr.	81	23	23
	Frontstreet	77	2	2
		188	52	52
34	Beekm: Str.	3	3	3
	Pearlstreet	12	7	6
	Fultonstreet	59	12	20
	Waterstr.	5	—	—
		79	22	29
27	Beekm: Str.	7	—	—
	Cliffordstr.	11	1	1
	Fultonstr.	58	19	9
	Pearlstreet	21	—	—
		97	20	10
24	Beekm: Str.	—	—	—
	Goldstreet	4	4	—
	Fultonstr.	86	34	3
	Cliffordstr.	—	—	—
		90	38	3
19	Beekm: Str.	18	15	15
	Williamstr.	20	8	6
18	Annstreet	28	28	20
	Williamstr.	21	21	21
	Fultonstr.	51	45	14
	Goldstreet	7	7	3
		[illegible]	58	[illegible]

38. 23. 21.
101. 58

Block	Street	6-7	7-8	8-9
9	Beekm: Str:	36	36	8
	Nassaustreet	52	22	7
	Annstreet	47	13	5
	Williamstreet	18	10	10
		153	81	30
8	Annstreet	108	75	54
	Nassaustreet	70	43	16
	Fultonstreet	58	8	8
	Williamstreet	3	3	3
		239	129	81
6	Fultonstreet	185	101	101
	Dutchstreet	25	20	1
	Johnstreet	22	13	13
	Nassaustreet	86	35	19
		318	169	134
7	Fultonstreet	64	8	2
	Johnstreet	2	2	2
	Dutchstreet	19	9	–
		85	19	4
17	Fultonstreet	79	40	7
		79	40	7
	Totale	2270	1383	893

Block	Street	6-7	7-8	8-9

Block	Street	6-7	7-8	8-9	Block	Street	6-7	7-8	8-9

Menlo Park Notebook #133 [N-80-00-01]

This notebook is undated but was probably used in 1880 or 1881. The entries are probably by William Carman and consist of "references to note books found by Messrs Edison & Batchelor." The label on the front cover is marked "Wm Carman" [crossed out], "References," and "Private" [crossed out]. The book contains 284 numbered pages.

Blank pages not filmed: 24-283.

Missing page numbers: 1-6.

References to note books - found by Messrs Edison & Batchelor -

Ground glass top plat lamp
Vol. 26 Page 65

Test of Reg Dynamo with Fairbanks Scales
Vol 30 Pge 35 - July 5. 79 -

Boehm int. Vol. 30 pge 75.

July 7. 1879 Experiments with belt dynamometer Reg. Mac. battery on field - Vol. 28. pge 163 -

Tested Res & Volts of 6 cord thread carb. lamp Vol. 28 pge. 180 Nov. 3. 1879

Vol 29. pge 15 - speaks in English provisional that I energize the field by a separate machine - get the english patent

Experiments on small dynamo with field in and out Vol 15 page 89.

One dynamo running field of the other with "old" resistance boxes in circuit probably about July 24, 1879. Vol 1 pag 254, 255, 256 & 262.

The test on the Dynamo that Sawyer made Feby 13. 1879 Vol 14 page 165

Ground stopper with platina wires sealed in
Mch 20. 79 Vol. 22 pges 27 & 29.

Regulating field, Batchs writing shows Dynamo 2 fields & one adjustable resistance, no date, its bet Apr 3 & May 30, 1879
Vol 22 page 51

Plating ends Vol 57 pge 5

Holes in Wood Vol 27 pge 57.

Belt dynamometer Mch 2 1879
Vol 47 pges 165 & 167.

Copper carb: Mch 4.80 Vol 70 near end

Contraction on pump Vol 85 pge 97.99

Plating carbons to clamp Dec 13.1880
Probably Horrick's writing Vol. 125 pge 149
and 163. — We probably commenced
plating in Oct 1880.

New Resist coils 2 feet high June 16 79
Vol 79 pge 50.

Transmitting power, supplying field of ug
machine Aug. 12.79 (probably same book)
pge 121 etc.

Resistance in field Vol 41 pgs 37. ~~pxx~~-
Nov or Dec. 1879

Edgewise loop (Swan) made Jany 25-
1880 Vol-70. pge 37.
Banknote paper Jany 23.80 Vol 70 p 41

Plate carbon to clamp July 5. 1880
Vol 104 p 142.

Bank Note paper Jany. 80. Vol 41 pge 77

Copper plated carbon Feby 24. 1880 lamp
730 Vol 41 pge 141- also lamp 805
pge 185- also lamp 934 pge 239—

Gramme on field June 16. 79. Vol 77.
pgs 4.5.6 & 7- again on pge 32. again
pge 44- — From Notts index see
No. 4. pgs 105 & 149 Feby 15. 1879

In re Interference - Edison vs Maxim vs Swan
Edison's Exhibit Q.

W.H. Kenyon
Notary Public

Test of Edison machine. plat 2.3.4.5.6.7
8.9 & 10 Values on field - Vol. 77 page 61.
see also page 74 - Speaks of 22.5 Magnets
per h.p. page 151 July 1.79.
Vol 78 Gives page Dec. 27.79 -

Brackett & Young's test April 3. 1880

Carbon shapes - Maxim's Vol 51 page 41
Apr 7.80 - others on page 43 -

Vol 67. Jany. 2. 1880
No 189 - 173 hours. No 159 burned 480 hours
No 255 burned 294 hours - No 223 burned
262 hours - No 193 burned 376 hours
167 buckled 15 hours

No 155	280
No 201	280
No 164	322
No 172	259

Rowlands test published Mch 80
(plating done prior to that. pbly
Jany 1880. So Francis says=)

Plating ends of Carbons Vol 42 pg 69-71
Also caveat book page 131

Manilla fibre .007 thick Mch. 80
Vol 57 pge 5

Hole through horseshoe, thickened part.
extra piece paper each side of horseshoe
— spoken of in caveat above mentioned
pge 131. caveat book

Ground stopper lamp. Mch. 29. 80
Vol 57 page 1. 4. 7. 9. 11. 13. 15.
Mottos index see also Book No. 146. Also
No. 22 p 29. Mch 20. 79. No 26 p 65 Feby 20. 79
No 80 p 97. Oct 2. 79. No 20 p 1. Feby 24. 79—
No 57 p 83 & 87 Mch. 30-80

Carbon- broad strip arch (Swan) Vol 51 pge 27. April 6. 1880.

Plating- Rowland here July- 1880.
Francis did the plating so he could
see it had been some time previous

Carbon spirals Oct. 19 1879 Vol 85-p 169

Herald article Decr 21. 1879 all
carbonized loops.

Paper lamp Oct 22. 79 Vol 85-p 177

Magazine lamp Jany. 6. 1879 Vol
3 p 49.

Dynamo  Feby 13. 1879.

Sealing wires in Feby 3. 1879.

Edison's Exhibit OR
Dec 18, 1883
W.H.C.
Notary

Stopper sealed wires Mch 79.
Vol 22. p 27 & 29.

Regulator (Sunflower) Vol 22, p 51

Shop lamp expt Vol 13, p 95. 97 & 99.

Regulate current by moving the brushes. Experimental research Vol 5 pge 102. No. 11. pge 86. Feby 20. 79.

Carbons. of paper, Vulcanized fibre fibres etc. caveat Oct 28. 1879

Plating paper ends. Exp Research Vol 5 pge 131.

Plate or disc Armature core

Mott Index

Book 56 p 205. Feby 15. 80. p 240 Mch 26. 80. p 187 Jany 31. 80. No 13 pge 129. Feby 1879. No 41² p 177 Feby 80 p 209 Feby 9. 80. Mott Journal Mch 15. 80 No 13 p 135 Feby 27. 79. Order Book No. 1. pge 207. Jan 2. 80.

Arctic Dynamo. Order Book No 1. p. 231. May 20. 79. Shipped to Leggett & Co. N.Y.

Melting metals between carbon points Experimental Research. Vol. 1.

1° - 100 - 18 may to 31. 12 dys

2 100 . 1 June " 9 June 9 dys

3 . 100 . " 18 " 9 dys

4 - 100 - June 14 - 1° July 484 13 dys

5 - 80 - " 14 " 9 " 4 dys

480 Bottles of ~~Clarets~~

475

42

7 / 6

Menlo Park Notebook #134 [N-80-08-09]

This notebook covers the periods August 1880 and October 1884. The first part is by Alfred Haid and contains analyses of ore samples sent to the laboratory in 1880. The second part was used by Edison in 1884 to record notes and drawings of the telephone. Parts of the book also appear to have been used by Edison's daughter, Marion, for drawing, writing, and math exercises. The label on the front cover is marked "Mr. T. A. Edison." The book contains 280 numbered pages.

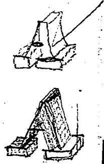
Pages not filmed: 60-66, 75-115, 118-124, 127-135, 138-139, 142-172, 177-182, 185-217, 220-258, 261-270, 279.

Missing page numbers: 45-46, 67-74, 125-126, 173-176, 183-184, 259-260, 271-278.

751

13

15



August 9th 1880

1.) Silas Draper Rock Port
Jackson Co. Oregon.
letter with enclosed 3 little
fragments of oven, about
Nothing

rd,

Nov. 3. Green paperbox cont.
letter and about 1 lb. Quartz
Button 0,9 Z { 0.3 Gold 0.3
{ 0.6 Silver.

August 9th 1880

1.) Silas Draper Rock Port
Jackson Co. Oregon.
letter with enclosed 3 little
fragments of ore, about 5 grams altogether
Nothing

---

letter, Vancouver Barracks, W. T.
2.) A. J. Greene Headquarters
Department of Columbia July 27th
3 lbs. black sand, also a little
box cont. a few fragments of [illegible]
about ½ gramme in weight
Black sand 1 oz. button $\begin{cases} 0.45 \text{ Gold} \\ 0.55 \text{ Silver.} \end{cases}$

L. Sirrine, Alford, Berkshire Co.
Mass.
Nov. 3. Green Paperbox cont.
letter and about 1 lb. quartz pyrites
Button 0.9 Z $\begin{cases} 0.3 \text{ Gold } 0.3 \\ 0.6 \text{ Silver.} \end{cases}$

Nov. 4. A. C. Eddy
no letter. Theresa N.Y.
Paperbox with abt. 2 pounds minerals. These specimens
letter came. contain only traces gold
No good for us.

Nov. 5. 16. Aug. 1880

A. H. Hovey 27 East 55th St.
N.Y. city
Copper ore {In 50 grains ore
3.720 Cu = 7.44 %

Nov. 6 Henry Zeltner, Brewer
Morisania N.Y.
Sedimental ore No letter, he
Gold ??? was here himself
Button 4/5 oz.
0.3 oz Gold
0.5 " Silver.

---

7) Perry & Dickinson, Assayers
Garfield, Chaffee Co Colorado
letter and two small paperboxes,
both of them containing the same
specimen of rock, which they
suppose to carry Pt. Nothing

---

8) J. F. Justice, Azusa
Los Angeles Co. California
Letter and one small piece of
rock. that the assayers cannot
agree upon.
1 oz Silver and traces gold
cannot be worked.

---

9) J. W. Rayburn Corvallis?
Oregon.
No letter. Large tinbox with ore
Only traces of Gold
as the rock is very hard it
cannot be worked

10.) F. A. Bonnel 48 [illegible] Newark N.J.
Letter & package ctg. 3 specimens of (black Sand. Magnetic
. A. 1.00 button 0.4 gold 0.6 silver
. B. 0.7 button 0.2 gold 0.5 silver.
C. 0.8 button. 0.6 silver 0.2 gold

11/ No letter G. H. Bonnatt, Fort Bowie, Idaho.
Quartz with Pyrites
0.2 oz gold, little silver.

---

12) John C. Anderson, Eaglerock Idaho.
Lettered little tinbox contg. some pieces of granitrock!
Asks if Platinum
No Pt but 0.1 oz gold,

John Anderson, Eagle Rock Idaho.
Black sand, magnetic.
0.2 oz Gold per ton
Good for us.

Dr. B. C. Dyer Bodie Mono Co. California. looks like quartz mill tgs.
2 bags tailings. I & II
I nothing but traces of Gold
II 0.15 oz Gold per ton

---

de Castro, 54 Williamst. N.Y.
1 bag ~~tailings~~ common sand (95 lbs.
Very poor; about one dollar.

C. D. Dobbins, Room 29
Trinity building, 111 Bway N.Y.
Tailings from the Hathaway Hydraulic Mining Co. Nevada Co. California.
These tailings are pebbles and gray sand
Nothing of it magnetic
2 oz. Gold per ton. Will test it for Te

John F. Haynie Cabot
Arkansas
Letter and 1 lb. of Sand marked #6
Yellow Sand, contg. little Mika.
Not magnetic. Only traces Gold.

Guy H. Gardner. 14 South William St.
N.Y.
6 bags of tailings with letter.
only traces of Gold.

Naomi P. Tadd, Forest City
Minn.
2 little bags of stone I & II.
Nothing.

I. M. Longyear, Marquette L.S. Michigan
"Quartzite" as he says. but it is not. Poor stuff 2 oz. Silver.

C. L. Lane, Bonanza Bar
Cassia Co. I.T.
Black Sand. Magnetic
Nothing.

G. H. Moore Northville N.Y.
Rock contg. Pyrites.
Only traces of Gold.

Ira F. Crowell, 438 Pine St.
Providence, Rh. Island
Black Magnetic Sands
1/10 - 1/15 Oz. Gold.
Easy to concentrate it.
Good for E. Process.

James Demareau, Custer City
Dakota T.
Ore which the local assayer pretend to contain Tin and Platinum. Nothing

John Bingham, Conklingville
Saratoga Co. N.Y.
3 Specimens of minerals
Nothing.

William Manning,
North Cannonville Oregon
Black Sand. Asks for
Platinum
Nothing.

W. J. Danner, Burlingtown
Iowa.
Grey Quartz: Asks for Pt.
No Platinum, Only traces
of Gold.

Mahlon Cleaver
Crawfordsville, Mont. Co.
Indiana.
Sand contg. glittering particles.
They are Sulphurets
Nothing of any value.

F. A. Cole, Northville N.Y.
Piece of rock.
Only small traces of Gold.
Cannot be worked.

Seems to be good

S. P. Buell, Prisman Boulder Co.
Colorado.
Soft rock with Pyrites.
7 oz. Silver } per ton No Pt.
1/2 oz. Gold }

C. W. Ayres Tombstone A.T.
Lot of small specimens, every one of them is rich in Copper, some contg. considerably Ag. some also little Gold.
If all these specimens are taken from the same locality, or from localities close together the region must be very rich, and worth while to be investigated ~~[illegible]~~

Capt. C. A. Hogan
Castle rock Wash. Terr.
Infusorienerde

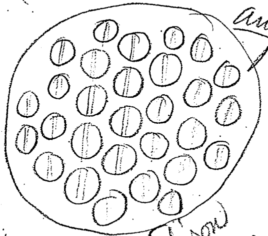
Barron Markham & Co.
Sidney N. S. W.
Pyritical rock.

Junction City Oregon
John S. George.
Slightly magnetic Sand and piece of rock.
I think it is salted as the rock only contains traces Gold, while the Sand yields $7.00 p ton.
The white powder is Quartz Sand
The metal is no metal but a worthless sulphuret.

George W. Parish
Pleasant Grove, Yakima Co.
Washingt. Terr.
Traces of Silver. No Gold.

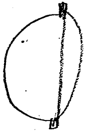
Gus Knight, San Bernardino
California. Yellow Sand
Nothing but traces gold.

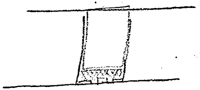
Dot Edison

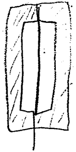


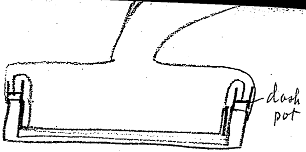
angel

Miss Marion Edison
Sweetest of all

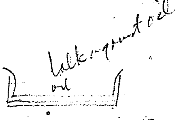


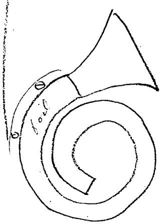


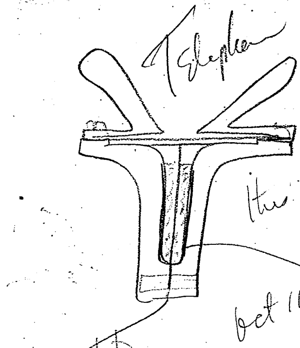




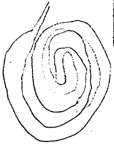
Telephone
Oct 10 1884
TAE

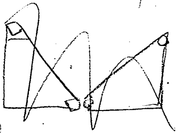




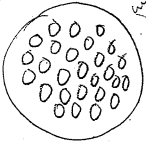


Oct 10 1884
TAE



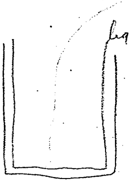


Telephone Oct 10 1884 JAE



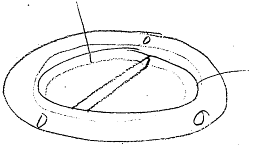
metal

foil like Harmony

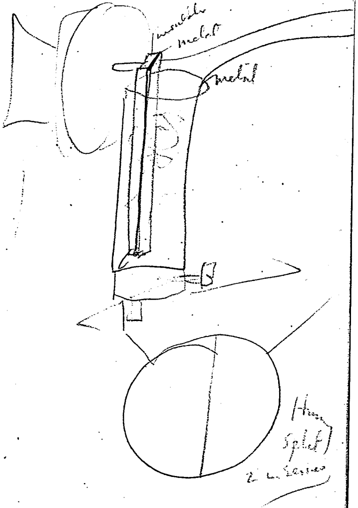


lengthen this

free Magnesium
place Carbon
Cut ribbon & Sieve

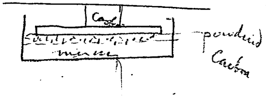


foil over 2 in Series

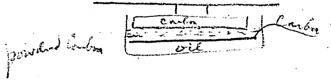


Telephone Oct 25 1884

TAE

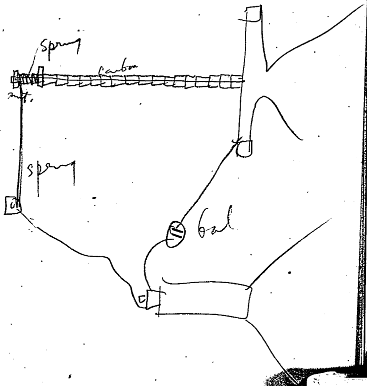


also oil

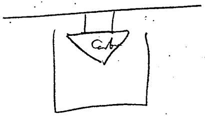


Telephone Oct 24 1884

Try Square diaphragm
in all the telephone Experiments

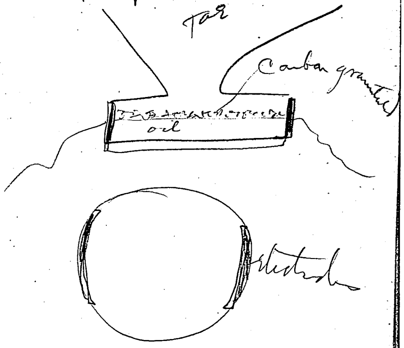


Telephone ~~Oct~~ 24 1884 TAE

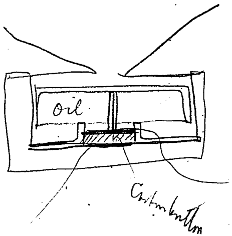


Try following - Galena - Calcopyrite, phosphide Iron, Conducting Sulphides peroxide Manganese art & native selected, = peroxide Lead, Peroxide Silver = Silicon -

Telephone Oct 24 1884



Telephone Oct 24 1884
TAE



Telephone Oct 24, 1904
TAE

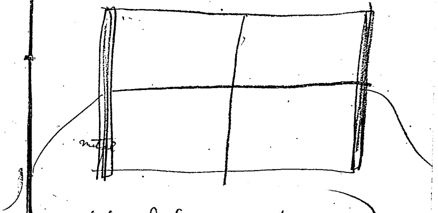
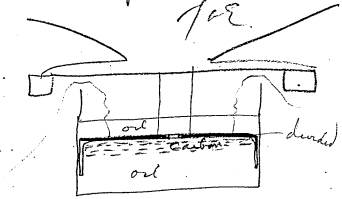


plate which is insulated covered
with granulated Carbon held on
by adhesive mixture. talk to this
german plate --

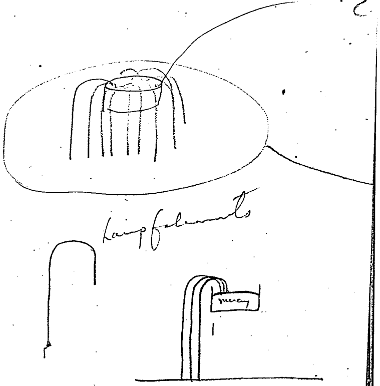
Telephone Oct 24 1884
TAE



grind up conducting Lampblack with oil etc see if can make a conducting contact transmitting liquid —

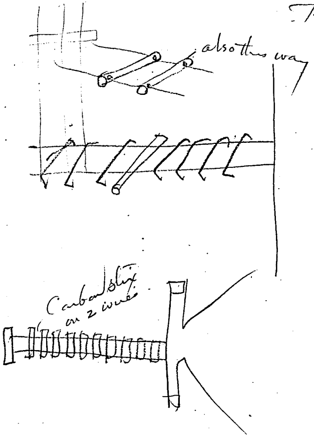
Telephone Oct 24 1884

TAE



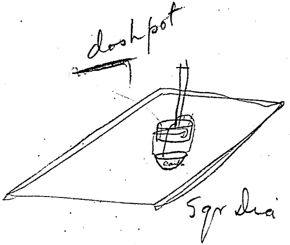
Telephone Oct 24 1884

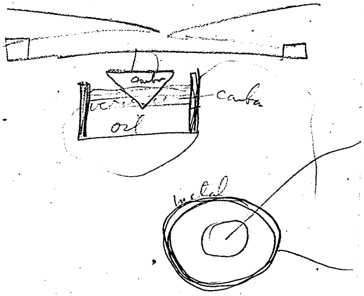
TAE

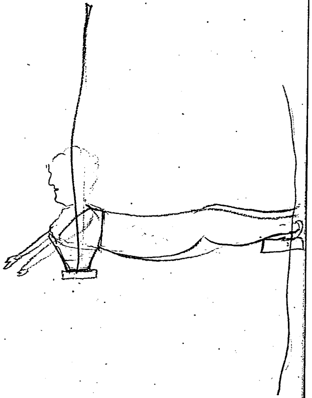


Telephone Oct 24, 1884

TAE




amber
carbon
oil
metal



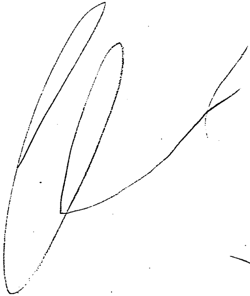
Telephone Oct 24 1884

Send to Lamp factory for some
Carbonized Cotton.

Mix anthracite Carbon with
Rubber - also with Copal
softened with boiling Linseed

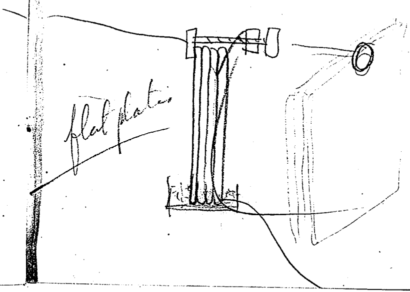
Try that mixture of plaster
paris & Carbon

Try Lampblack & granulated
Anthracite Carbon with
mineral oil - good



Telephone Oct 24 1884
JAE

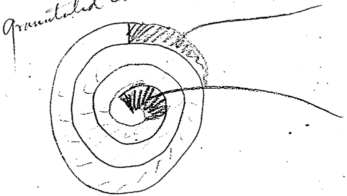
Get .40 primary & 100 to 300
secondary Coil wound by
Jas Mayer to give $\frac{1}{4}$ @ $\frac{1}{2}$ inch
spark try these against
Regular — think talking be
clearer —



Telephone Oct 24 1884
TAE

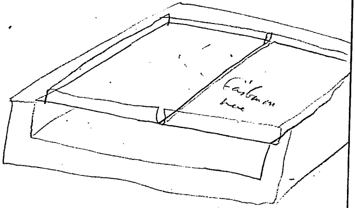
Carbonize some cloth at Lamp factory various kinds for telephone Electrodes =

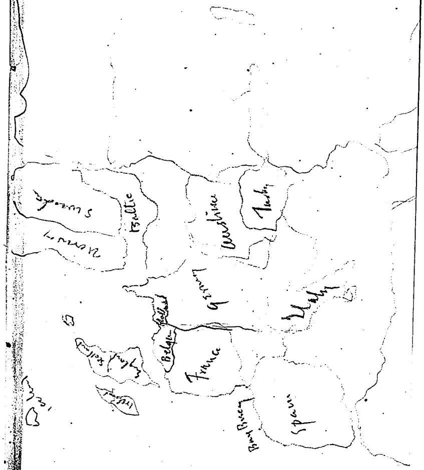
Granulated Carbon



Telephone Oct 24 1884

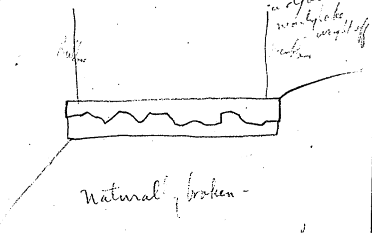
TAE



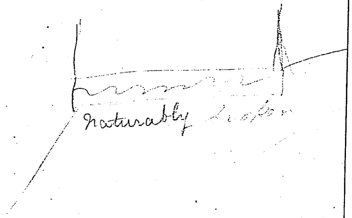

Baltic
Austria
Italy
France
Spain

73
14
62
73
04
17
64
42
43
49
44
63
40
4808
70
67
48
40
49
44
54
52

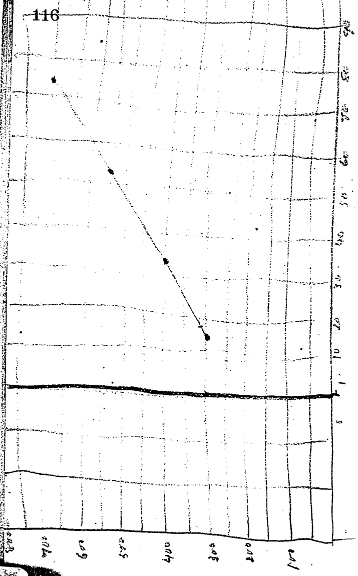
Telephone, Oct 24 1884



natural broken -



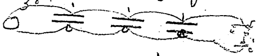
naturably broken



4 Condensers

100 000

6000.	870
12000	435
24000	217
48000	108
96000	54 — $3\overline{)54}$ 18
192000	27
384000	13 mf —



Railroad

Railway

Railway

Railway

Railroad

Railroad

Railroad

Martin 8
Olson
5 - 12am
Parking
Betty

Each Table T T T

Table Table Table

Two suits - a piece for Tom - & Millie. Table Table

Stockings. Table

Dark waists Table

Two pair of shoes, for each

two pairs of rubbers.

Hats two each

Ties dark ones.

Silk thread, gloves.

I have any by ... pet

Some pants.

2 2 2

25 2 25 2

Yours Tr

24

25 26 ... 30 31 ... 10

33 34 35 ... 29

35 31 ... 35 36 37

26 20

4 5

Wm. Orton

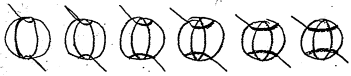
Wabash

Valley

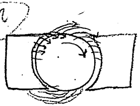
Wabash Valley

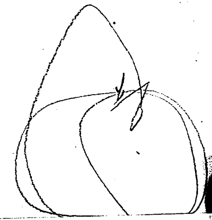
Valley

R Royalty



Wm. Orton





Menlo Park Notebook #135 [N-80-07-30]

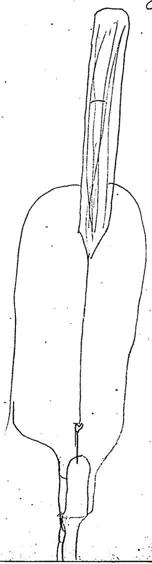
This notebook covers the period July-August 1880. It was used by Edison to record notes and drawings relating to lamps, dynamos, meters, voltage regulators, and the electric railroad. There are also notes on electric railroad patents issued to other inventors. The label on the front cover is marked "Private Patent Book" and "T A Edison." The book contains 276 numbered pages.

Blank pages not filmed: 20-51, 78-276.

Missing page numbers: 75-76.

July 30 1880 –

TAE
[illegible]



Self feeding Lamp
incandescence.

July 20 1880 TAE

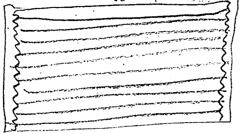
Want to claim Mica as seperator in Commutator =

Show full working drawings of Commutator =

Prepare Rowlands patent,

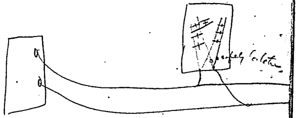
Carbon clamps - H Combzd.

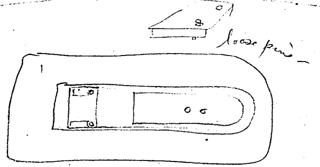
Carbonized as a whole after bending then break off =

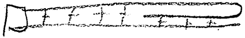


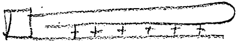
July 31. 1880
TAE
Chas Batchelor

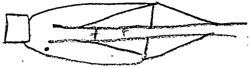
Berlin Porcelain ware for flasks - say same as Combustion tubes = for Carbonizing:

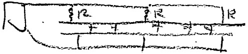








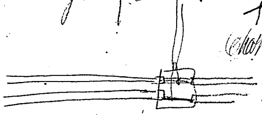


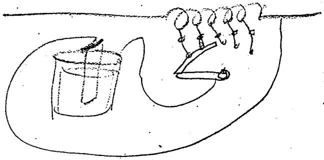


July 31 1880

TAE

Chas Batchelor





adjustable Meter

Twenty Thornby

Francisco

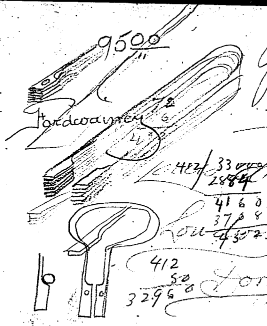
Francisco

Francisco San Francd

Francisco

San Francisco

9500



Hardwarmer

July 31 1880

412 | 33000 | 80
2884
4160
3708
452

Lou

412
80
32960

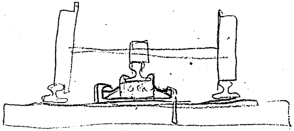
Forgaille

Electric R.R. Aug 3. 1880

Paint the whole of the Rail with an insulating paint (all except top) -

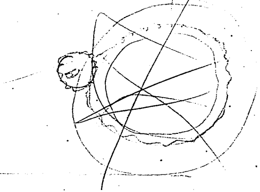
TAE

 this for street RRs painted under a.

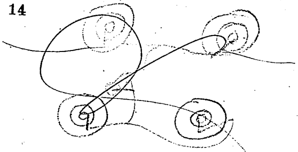


put this in

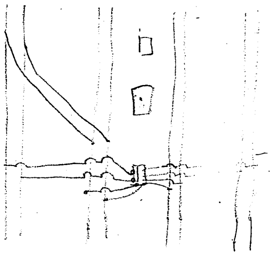
Aug 3. 1880



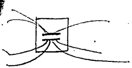
put this =



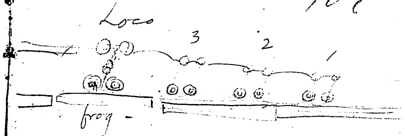
Aug 3 1880
TAE



Patent this,



Aug 3 1880
TAE



patent,

In Reversing Motion Can
Reverse field magnet
Mention if not already shown
Auxilliary Coil in field

Mention, that train can be braked by opening ckt to Bobbin + short ckg it ~~also that in~~ or it may be reversed while in circuit thus acting as a brake, or its current.

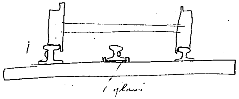
(12) Current due to the rotation of the bobbin by the train after disconnection with the track may be thrown through the brake magnets in the Cars =

Aug 3rd 1880
TAE

~~Patent~~

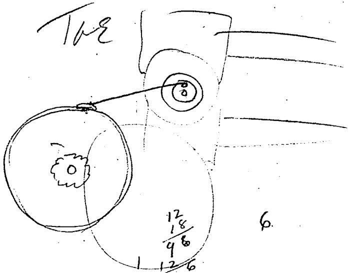
Show Hornigs new design

Aug 3 1880
TAE



 Aug. 5. T. A. Edison

TpE



12
18
48

1 12 6
2 1

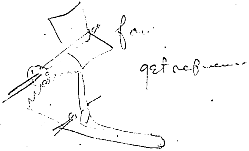
6.

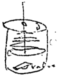
8

9.

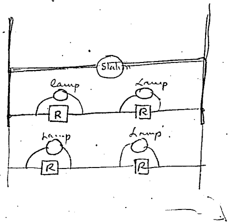
18.

Means for getting a slow movement to mechanism.

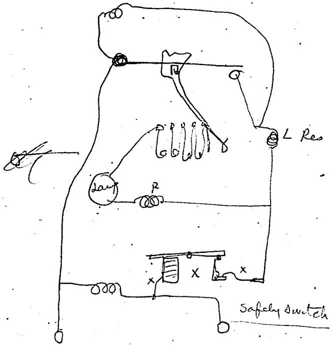




Constructs Rheostats of ribbon to
Expose great ~~surface~~ prevent heating
find reference =



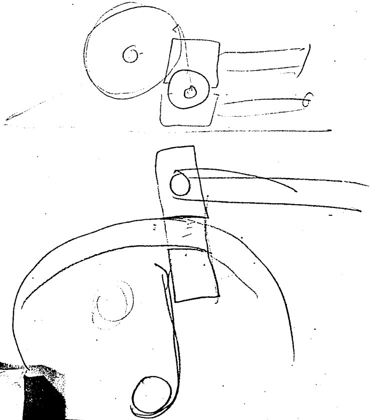
States that fracturing carbon due to sudden changes temperature Sudden heating disrupts - This due to Nitrogen gas absorbed by Carbon suddenly Expanding by heat —



abnormal flow Current causes attraction magnet & opening of magnet circuit - X. find in Chaffner under head Lighting ancestors, Over

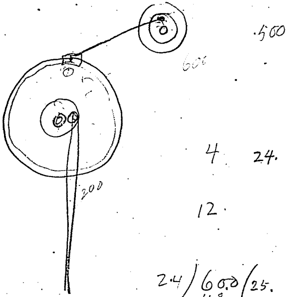
Over speaks of interposing in conductor a section of Conductor more readily fused than the Conductors constituting the rest of the circuit so that when there is ~~too~~ much Current it will instantly melt & destroy Continuity of the circuit.

Say that current through Lamp begins to heat Carbon which rapidly acquires resistance & the resistance of the Carbon increases in proportion to the movement of the lever D over the contact points M until all the 5 Res O of 2 ohms each have been cut out of circuit. he infers that just as you cut out R that the carbon increases its R — hence the changes does not effect the total Res



60

300
60
18000

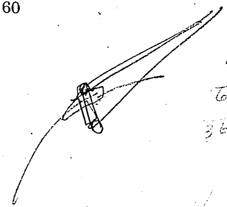


4 24.

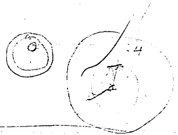
12.

24) 600 (25.
48
120
120

4



12
50
600.
60
36000



12) 600 (50 6.
60

12
50
600

12
50

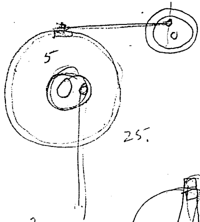
60

6

12

15
50
750
60
45000

9.



6.

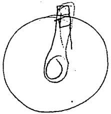
5

600

6 foot + 3 foot

6 bo fee

25.



3

6.

18.

6

9 0 6 0

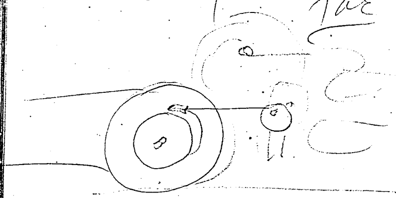
300.

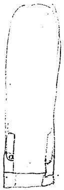
20

10.

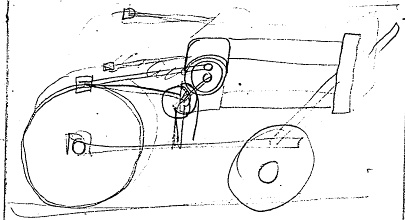
10

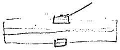
Aug 3 1880
TAE



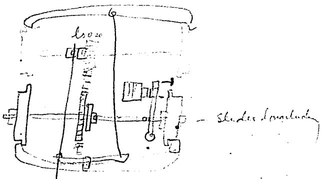


Aug 3 1880
TAE





Olmsteads E brake



61089 dated

Jany 8 1867

has patent 1869 — april 27 —

Pat 98 880 Jan 18 1870

substitutes friction rollers for

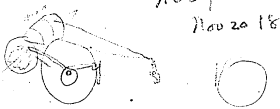
gears

also 89 495 — apl 27 — 69

nothing valuable in either

Friction Brake

No 59 805
Nov 20 1866

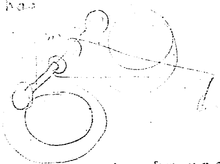


claims nothing but clutch

has patent. 49 842

one Jany 15 1874 - 151 335.

has



when magnet [illegible] swings against [illegible] shaft of car wheel that [illegible] the [illegible]

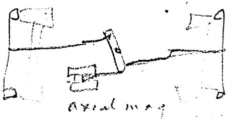
H S Daggett,
No 116 818, July 11 1871

lever brakes ~~tight~~ has Chains on Extra wheel which is rotated by a belt from main axles but it cannot wind-up chain as it (the belt) slips but the axles is drawn outwardly by a magnet thus tightening the belt & the shaft rotating winds up the chains —

Geo En-Earl. 139557.
1873 =

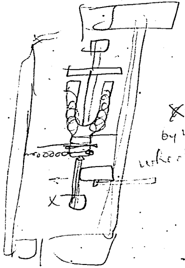
Electromag etc, Brain
axles do [illegible]
[illegible] —

P. V. Conover 175935 April 11 1876



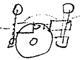
Whipple 22213. Nov 30 1858.

no spec



X Shaft rotated
by main axles by wheel
wheel (mag closed causes do
, rotation winds up
chain -

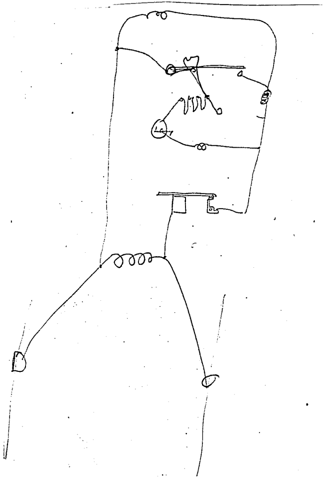
Carpenter 19 Jan 1858.



N.9

2240
6
13440
5.00
139.40

[ITEM FOUND IN BOOK]



Menlo Park Notebook #136 [N-80-08-11] (NOT FILMED)

This notebook covers the period August-October 1880. Most of the entries are by Charles P. Mott. There are also a few entries by Charles Batchelor. The book was used to record land owned by George Goodyear at Menlo Park. The label on the front cover is marked "Lands," "Lots," and "C. P. Mott." The book contains 284 numbered pages. Approximately one-third of the pages have been used.

Menlo Park Notebook #137 [N-80-07-16]

This notebook covers the period July-December 1880. The entries are by Francis Upton and Francis Jehl. Some entries are probably by William Hammer. The book contains calculations and notes regarding insulation for underground cables and the electric railroad. The label on the front cover is marked "Lines Insulat" There are 284 numbered pages.

Blank pages not filmed: 88-91, 140-143, 146-149, 152-253, 262-267.

Missing page numbers: 111-114, 271-272.

Conducting wire to lines
12.3 Ohms

to RR 9 Ohms

In bridge German silver box with string on it balanced by Box No. 2 6300+1600+400 Ohms in $\frac{1}{1000}$ other side of bridge

$$\begin{array}{r} 128 \\ 2\overline{)\,260} \\ 180 \end{array}$$

Frac Harrison

138 Rev
27 Ohms,
320 Def,

July 16 1880

wet day		To ground	
18 wire circuit	55	25.	43.
Carmer Circuit	1.4	4.2	8.2
	2800	2900	2100
6 wire circuit	61.8	25.6	50.5
Edison's line	1.6	5.8	9.4

The weather &c Book 103
page 155

In the afternoon
Carmens circuit again
tested 2)2850
P.M. 1425
.120
1.65 Ohms

Dry day

P.M 2900 to ground
The kent wire leading
to the lamp-posts dug
up and left in the air
to dry.

Monday – Yesterday
was a dry hot day
Nearly all the kent
wires leading to the
lampposts have been
exposed to the air so
that they have no
connection with the
ground

July 19
8-30 A.M.

$\underline{\rfloor 2820}$
1 4.1 0
6 3
7.7 Ohms to ground

A bucket of tar tried and its resistance found to be extremely high could not easily measure

Line 12 M

$\underline{\rfloor 2650}$
1 3 2.5
.6 3
6.9 5 Ohms

Insulation, Carmen's Circuit, July 19/80

All Kerite lamp wires, where exposed to earth, are being overlaid with rubber tape ("piping") and served with coal tar, then left [illegible] exposed to the sun to harden,

July 19 2 P.M.

(2900

14.5
6.3
8.2 Ohms

These lines cut off that were tacked to the boards and the resistance to the ground

3900

or 13.2 Ohms

other line 4200 Ohms

14.7

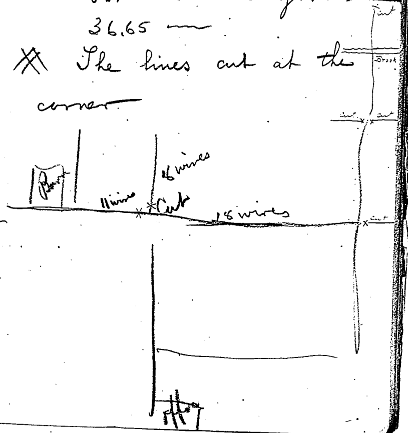
15900 Ohms between line

29.5
12.6
16.9 Ohms between the lines

About 2500 feet of the
the circuit left.

6290
2000
8290
41,45
6.3
35,15 ohms to ground
36,65

The lines cut at the
corner



after rain

(3800

$$\begin{array}{r} 19 \\ 6.3 \\ \hline 12.7 \end{array}$$ Ohms

July 20
Test R.R.

Insulation both wires leading to track to ground

6290
4
25160
6256
6250
12000
7000
5)56660
2833 Ohms to ground

Leading wires
)1800
9.0 Ohms
)2800
14.00
9
5. Ohms between tracks

220

193

5) 425,920

425,920

(1850
925
4.5
575

170
4.5
7.5

(1200
600
45
1.5 Ohms both
sides to ground

100) 21,296 ~~00~~

21,296
20
425,920

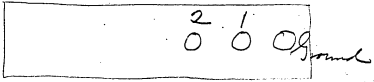
42.

33280	4.5220
70	1.84451
log 63000	6.2007
	2.5678

370 Ohms

B R

The track disconnected just beyond the ~~place~~ post which has been insulated



On Tr to ground

70
6300

6250
6250
6290
6290
8200
33280

6250
11
73

41280 4.6158
70 1.84571
comp 1500 6.8239
3.2848

1920

1630 3.2122
70 1.8451
1500 6.8239
1.8812

76.1

R, R

No. 1 to ground

$\frac{70}{1500}$

6250
6250
6250
6250
6290
6290
2700
41280

Paper to No 1

$\frac{70}{1500}$ 1630 Ohms

$\frac{1}{200}$

6290
6290
1930
14510
725

R. Q.

No 2 to tarred ~~pitter~~ ties

$\frac{1}{200}$ 6290
780
7070
35.35

$\frac{70}{3200}$ 6520

Result

* Paper 75 Ohms
Tar 38 Ohms

Three ties with no paper

R. R.

6290
9600

rat (15.8.90

79.

Cars off track

6290
6290
6250
6000

(24830

124.15 Ohms to ground from paper side.

R. R

Far side

6290
6290
6250
3600

224.30
112. Ohms

100 feet 5a Ohms

6290
6290
4500

17080
.8514 Ohm

112
8514

26.0

R. R between rails

Been raining all night

5 Volts.

(3450
17.25
9
8.25 Ohms

Positive

Placed 2 hours ago - everything
moist —
Reversed the Current to Negative

R Same.

20 Volts =
Res - [illegible]

[illegible] —

26 Volts =
Res - 1/10 [illegible] higher R

July 22 1880

Everything very wet

July 22 1880

18 wire circuit

Between wires

6920
2100
(9020
45.1
19.6
~~36~~ Ohms
32.8 = 32.5 Ohms

One side to ground

(6290
31.45
76.3
25.15 ohms

Other side

(4400
22
6.3
15.7 ohms

July 22 1880

Line 6 wires laid in tared boxes to Cedar Street.
To Ground

5700	7600
28.5	38
6.3	6.3
22.2	31.7

6290
6600
12890
64.
12.6
51.4

~~6290~~
~~6100~~
~~12390~~
~~61.9~~
~~1~~

July 22^d 1880.

Carmen circuit 25 wires
Between wires

6250
7150
|13400

67.
12.6
54.4

To ground

6290
7000
|13290
66.45
6.3
60.15

6290
6100
|12390
61.9
6.3
55.6

R, R, July 22, 80

8000
6300
1700

Between track) 13 Volts

~~6290~~	6290
~~6290~~	6290
~~700~~	1300
~~13280~~	13880
~~9.~~	9
~~4.2~~	4.8 Ohms

33 Volts the same

31.1

6250
2
12500
6290
6290
5000
30.080

Balanced

July 23 1880
rained nearly all night
no sun

6290
6290
500

13080

13,080 Ohms
9.0

4.0 Ohms

4. Ohms between tracks

One side to ground

.6290
1200

7490
4.5

2.99 Ohms

It is proposed to insulate one side only of the conductors and to leave the other uncovered. Test insulation one side only

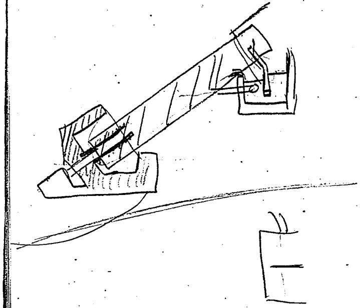
R. R. July 24 9. A.M.

Resistance between the lines 201(2700
13.5
9
4.5 Ohms between the tracks. Yesterday and last night were without rain ~~and~~ though the sun has not shown enough to dry the sleepers. I could not find any ground on our sidi-

Cirmans circuit

6290
6280 boxes of ground
6250
6290 One side
6290
1400
(1)
32720
163 Ohms

6250
6250
6290 Side
6290
1008
(.2)
26080
130.4 Ohms



A wire wrapped about one of the conductors and buried about six inches in moist earth

(2)

6290
6290
6250
6400

24236
121

(1)

6290
6290
9400

21980
1.09.4 Ohms

Carmens line

dry day – fresh covered with cloth and tarred

6250
6290
6290
7700
26530 Ohms.

1.8549
1.8549
116464
8.0610

3.4172

2620

4.6155
3.4172

1.1012

1215 per H. P.

1324

Best in oil
Copied

6250
6250
6290
6290
21000

27080

1354.0 Ohms Cold.

16 candles

6290
6290
4800

17380

86.9

215 = D

71.6

1,9206
1.9206
1,6464
8.0888

3.5764 3760
4.5185

.9421 8.75 per H.P.

1324

Bast in oil short time Copied

3-2 48 candles

6290
6290
3720

16300
81.5

250 = D
83.3 Volts

$$C = \frac{E}{R}$$

$$C' = \frac{E}{R+r}$$

$$\cancel{R = \frac{E}{C} =}$$

$$\cancel{R + r = \frac{E}{C'}}$$

$$R = \frac{E}{C}$$

$$E = cR$$

$$c' = \frac{cR}{R+r} \qquad R = \frac{rc'}{c-c'}$$

$$(R+r)c' = cR \qquad R = 2r$$

$$Rc' - Rc = -rc'$$

$$Rc - Rc' = rc'$$

Galva on 25.8 Ohms in shunt 20 cells

$$\begin{array}{r} 285 \\ \underline{275} \\ 560 \end{array} \quad \begin{array}{r} 560 \\ \underline{552} \\ 1112 \end{array} \quad \begin{array}{r} 270 \\ \underline{282} \\ 552 \end{array} \quad \begin{array}{r} 284 \\ 269 \end{array}$$

5000 Ohms in with galva

$$\begin{array}{r} 112 \\ \underline{122} \\ 234 \end{array} \quad \begin{array}{r} 234 \\ \underline{241} \\ 475 \end{array} \quad \begin{array}{r} 126 \\ \underline{115} \\ 241 \end{array} \quad 112$$

2000 Ohms with galva

$$\begin{array}{r} 187 \\ \underline{173} \\ 360 \end{array} \quad \begin{array}{r} 360 \\ \underline{365} \\ 725 \end{array} \quad \begin{array}{r} 175 \\ \underline{190} \\ 365 \end{array}$$

$r = 5000$

$C = 1112$

$C' = 475$

$C - C' = 637$

$$R = \frac{r\,C'}{C - C'}$$

$$\begin{array}{r} \cancel{6.7451} \\ \cancel{2.8041} \\ \hline \cancel{3.9410} \end{array}$$

~~8730 Ohms~~

$$\begin{array}{r} \cancel{1112} \\ \cancel{5000} \\ \hline \cancel{5560000} \end{array}$$

$$\begin{array}{r} 475 \\ 5000 \\ \hline 2375000. \end{array}$$

$$R = \begin{array}{r} 6.3756 \\ 2.8041 \\ \hline 3.5715 \end{array}$$

3730

r = 2000

c = 1112

c' = 725

c - c' = 387

~~2224000~~ ~~6.3472~~

2.5877

~~3.7595~~

~~5750 Ohms~~

725

2000

1450000 6.1614

2.5877

3.5737

3740 Ohms

3730 Ohms

Resistance high resistance galva 3735 Ohms

~~One cell through~~

20 cells on rails ~~and~~
20 feet long
~~20~~ 19 sleepers laid on
wet ground

Hot sun all day

3 P.M. July 29, 1880

Resistance
8.900 Ohms 20 cells
of battery.

The weeds pulled from under
the rail which touched it
and the resistance
8.950 Ohms

13 spikes out
resistance

12.300 Ohms

The sleepers were allowed
to drop in some places

Ran up to 75000 — 100,000 Ohms

blocked each end so
that rail rested on
two sleepers

290.000 Ohms
standing on rails two men
220,000

25

.16

Three sleepers

250,000 Ohms

5280
4
211 rails per mile
19 sleepers per rail
1899
211
4009 sleeper per mile

4~~000~~) 4000~~00~~
100 Ohms per mile

Both sides raised resting on two sleepers

Result There is no certainty in testing ~~on~~ dry rails and sleepers
Method make as good insulation as is ~~[illegible]~~ wished to be tested then wet every thing and test.

1,600,000 Ohms
from rail on sleeper to good ground

Wet rail laying on the grass to ground
450 Ohms

Rail wet ~~under~~ on 2 sleepers to rail on grass
240.000
After some minutes
~~7~~8.000

July 29
Carman's line

Wound all the length
but about 300 ft on each cable
1 and nearly all tarred

~~750~~ Ohms

July 31 1880 8-30 A.M.

Carman's line all wound
with cloth and nearly
all tarred.

1400 Ohms
to ground each side
~~4000~~ Ohms
4000

July 31, 1880. 8-30 A.M.

Six wire circuit. Boxes with exception of crossings exposed to the air.

R = 150 Ohm

Aug. 2, 1880. A.M.

Cannens circuit between the wires 3400 Ohms

9.4 Ohms in box placed at end of wires leading from box.

Line and wire

~~22.8 Ohms~~

22.8 Ohms

Line alone

13.3

Spool 9.5

22.8
13.3
9.5 Ohms

Cammer circuit

again 3000 Ohms between

the wires

about 3000 Ohms to ground

but continually altering as

the wire was moved by

those working on it.

Aug 3 P.M.

After heavy rain for

an hour and a half

1430 Ohms

About 700 Ohms per mile

Morning 900

To ground 700 – 700

$20\overline{)5280}$
264 rails to mile

4250 | 3.6284
264 | 2.4216
 | 1.2068

16 Ohms per mile

3 1/5 Ohms per five miles

R. R. Short track

Tarred paper under the rails dry 120,000 Ohms

wet 7,000 Ohms

4:30 " 6.200

Later in the afternoon ~~ct~~ continually rising

Aug 3 after heavy rain for an hour

4250 Ohms

Aug 4 Rain during night very wet

2800 Ohms

~~car[illegible] 25 and 18 wire [illegible]~~

Aug. 18 10. a.m.
25. cable + 18. cable.
3,000 ohms bet. wires
1200. + 1650. ground

~~[illegible] 1085 [illegible]~~

12 feet rubber cloth 2" wide
weighs. 790 grains
7000 grains make 1 lbs

$$.790 \overline{)7000} \; (8.8$$
$$\frac{632}{680}$$

$$\begin{array}{r} 8.8 \\ 12 \\ \hline 176 \\ 88 \\ \hline 105.6 \end{array}$$ feet per lb#

50 cts. per lb. estimated
cost

That is about
1/2 ct per foot

Clear Rubber Tape wound on spindle $\frac{21}{32}$ in. in diameter, 1. ft. long. So wound as to be double thick the entire length.

When unwound tape weighed 160.2 gr

" " " measured 56.25. inch

$$
\begin{array}{r}
437.5 \,)\, 160.2000 \,(.34 \\
141.25 \\
\hline
18.950 \\
18.500 \\
\hline
.450
\end{array}
$$

~~grains~~ oz. per foot of cable. $\frac{21}{32}$. in. dia.

100. ft. of same cable would take 34. oz. or 2. lbs. 2. oz. which @ 60. ¢ per lb. = \$1.28. ¢

Martine wound on spindle same as on cable.

$$
\begin{array}{r}
2.5 \text{ in to each turn} \\
7. \text{ turns to in. of cable} \\
\hline
17.5 \\
12. \text{ in to foot.} \\
\hline
210.0 \text{ inches of martine}
\end{array}
$$

on each foot of cable same size.

Martine unwound and found to measure 201.5. inches.

Martine found to weigh 649.4. grains per foot on cable. $\frac{21}{32}$. in. in diameter.

Martine costs 13.4. ¢. per lb. add freight. and 16. ¢. add freight.

To each foot add ½. ¢. for winding on cable.

 Aug. 23rd 1880.
Carman's Circuit. 25. 18. 11. and Turnpike sections in, all others out.
Between wires 15. ohms
Ground. 37. ohms. both sides.

Aug 30 1880

25. 18 Turnpike section between wires 42.9. Ground 22.9 + 27.9 after the rain which This was after the rain which which was yesterday & today.

Aug 31 1880

First cable 5000 for 3 layers
Rubber 275 — 2 layers rubber

R"
R
G
Def

$\frac{50000}{1000}$

September 1 1870

Tests on the wire in the barrells. (1)

no 1
Def 186 Res 84 ohms (2)

~~2~~
~~2~~ Def 235 = 120 ohms

(3)
Res 4850 ohms, For 3 layers

Res 54 ohms layers (4) Rubber

!

$$\frac{100x}{100+x} = 100$$

1st New. - 250 - 252½	502½	
2nd Set. - 251 - 254.	505	New -
3rd Set. - 220 - 223.	443	$\begin{cases}250\\253\end{cases} = 503$
4th Set. 252 - 254½	506½	
5th Set. 251½ - 254	505½	

W. J. H.

Aug 21 1880

Line tests (25 cable) 10

Left hand binding post/ tests with ground ~~632~~ ohms.

Right hand one 650.

found a cross in one of the Clamp posts (a dead cross)

tested after thus 2145 ohms.

Ground 1085 both

This is the 25 and 18 wire.

Section of Carmans circuit wrapped once with muslin tarred, wound with martin covered with ~~first coat~~ Tar boiled with crude coal tar, half + half

Aug 21 1880

Carmans Circuit.

25. 18. + 11. wire sections in ckt. 765. ohms.

Aug 26; after hard thunder-storm of yesterday ground is well soaked.

Carmans Ckt. 25. + 18. wire sections in ckt.

Bet. wires 3,500 ohms

Ground. 1,250. + 1,435 ohms.

Carmans Ckt. 25. 18. 11. + Turnpike sections in ckt.

Bet. wires 73.6. ohms (Aug. 26. 1880.)

Ground 37.7 + 37.5.

Carmans Ckt. 25. 18. + 11. wire sections in ckt.

Bet. wires. 330. ohms.

Ground. 200. + 227.

Aug 26. 1880.

$R = a$ — $C = \frac{1}{R}$ 1st line

$R' = b$ — $C' = \frac{1}{R'}$ 1st & 2nd line

$R'' = \cancel{c}$ — $C'' = \frac{1}{R''}$ 2nd line

$C' = C + C''$

Aug 27

turnpike road. 76 ohms

Aug 28. 1880

[illegible] Turnpike
all side lines out except short
one main line by Edison's gate on
Turnpike.

Bat. wires 235. ohms.

Ground 131. & 83. ohms.

Aug 28. 1880.

Edison's Ckt. to day on corner
opp. office.

Bat. wires 135 ohms.

Aug 31 1880

Tested the wire covered by Howell with rubber cloth & tar. It was put in water, tested 120 ohms when plate was lowered down it went down to 77 ohms.

Bare wire tested also gave a Res of 100 ohms.

25 18 & Turnpike. 44 ohm
Ground ~~25~~ + ~~24~~

25 + 18 + 11.
Ground 67.5 + 65
Res of Line 126.

18. 25 wires

Line R. 950 ohms
Ground 497 + 482

Edison line to box on Railroad 76 ohms. Ground 43. 32

Edison's Line to box on corner of the office 247 ohms.
Ground 76 + 172

Sept 2 1880

Cable No 4 3 thickness muslin each tarred with boiled ~~coal~~ coal Tar. Res 120

Cable with three layers of Rubber cloth and 3 layers of tar. 3200 ohms

September 3 1880

one length of 100 of Bare Cu wire
submerged in water

Res 127 ohms

Cable No 1
One thickness Rubber tap (white) spirals
overlapping about one third and
tarred with stiff coal tar
Res 54 ohms. Cause so low
The iron plate was lower down
Than the other

Cable No 2
Three layers of Rubber cloth
3 layers of Tar

aug	Res
31	51.000
Sept 1	4850
2	3200
4	2630
6	1500
8	2400
13	1.910
14	2000
	2000
15	1800
16	
20	1000
21	1000

(No 3) Two Thickness of white Rubber cloth wound in opposite directions
Res 77 ohms

(4) 3 Thickness of cloth Tarred with boiled Coal Tar
Res 120 ohms.

No 5 two Thickness of Cloth each smeared with hot linseed oil.

Res Sept	Res
3	470
4	140
6	110

(No) 6 Cloth on Cable, with parrafin Rubber cloth (sez) cloth again with parrafin.

Sep	ohms
3.	1200
4	171
6	120

(7) 3 Thickness cloth served with coal tar treated with quicklime.

Sept 4 120 ohms

(8) Bare wire rubbed with dry hard parrafin Then rubber cloth black ~~two~~ Covered with ~~to~~ black rubber cement, then rubber cloth, Then cement, Then rubber cloth smooth down with hard paper

Sept 4 12500, Then went down to 7000 Sept 21 210

Sept 6 130
Sept 9 210
Sept 17 260

X

$\frac{800}{100} = x$

$\frac{1400 \; 5000}{8}$

$e \frac{\frac{g}{2}}{g + \frac{g}{2}} \; \frac{2g}{2g + \frac{2g}{2}}$ cls

e

$e \frac{\frac{g}{2}}{g + \frac{g}{2}} = \frac{e\,g}{3g}$

$e \frac{\frac{eg}{2}}{g + \frac{g}{2}} \; \frac{2eg}{2g+g}$

$\frac{10}{.5} \quad 2 \quad \frac{10}{10} \quad 1 \quad \frac{19}{20}\,e$

$e \frac{\frac{g}{2}}{e + \frac{g}{2}} \quad e \frac{g}{2g+g}$

9\. Bare wire rubbed with paraffine Rubber cloth then Cold and hot parrafine then rubber and parrafine and rubber cloth with more parrafine

Sept 4. 9000 went down in about an hour afterward to 3500

Sept 6 120 ohms
21 120 " "

10 Rubber cement on bare wire Rubber cloth, muslin, Compound 3# Rubber cloth, rubber cement, Rubber cloth rubber cement, Dusted with chalk

Sept 7 299000
8 1400
9 500
10 450
21 150

11 Rubber ~~cloth~~ cement on bare wire Thick
" cloth
muslin
Compound 1
Rubber cloth
" cement
Cloth
Cement
Dusted with precipitated chalk
Sept 7 79000 ohms
21 170 ohms

12 Muslin on bare wire
Compound 2 #
muslin soaked in linseed oil
Compound 2 # Thinned cotton =
seed oil.
Muslin
Rubber cloth
" cement
" cloth
Sept 7 26000
Sept 8 8000
" 9 740
" 10 540
" 13 300
" 21 180

13 wire covered with marlin
Then boiled in Compound
3 Then rubber cloth

14 7 (seven) strands wound
with marlin

September 14 1880

~~25 cable wire tests 23 550 ohms~~
No 25 wire Cable Tests 550, ohms
" 18 Cable tised 17, ohms,
There must be a dead
cross.

" 17 Cable 200 ohms.

25 wire Cable + Carmans line
about 25 ohms.

muslin
15 Refuse compound
muslin
Refuse Compound
Sept 13 Res 140 Ohms

16 White Rubber cloth 3 Layers
Boiled pine tar 2 Servings
Made to compare with
~~No~~ 2

Sep 13
176.000
14 85000
15 30,000
16 12500
21 1050

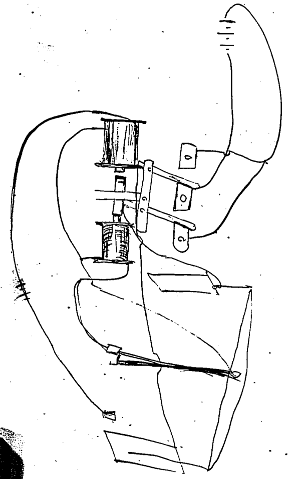
Test on Cable no 19

17 muslin, compound 4
muslin compound 4
muslin Boiled Linseed oil

Sep 17 70 ohms

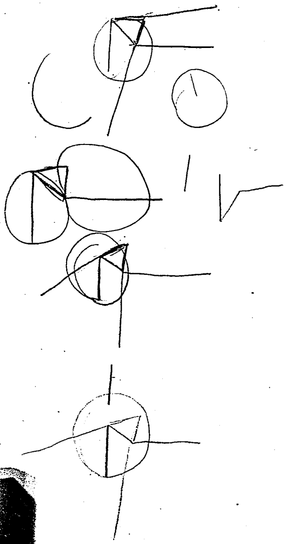
18 Three thickness of muslin
soaked in hot ~~linseed~~ pine
tar.

Sept 18 — 870 ohms.
" 27 70 ohms



19 Rubber cloth compound
7 Rubber cloth compound
Rubber cloth.

Sept 17 1.117.000 ohms.
Sept 20 116200 ohms
" 21 70000 ohms



20 Muslin
Compound #7
Muslin
Compound 7
Muslin

Sept 21 370 ohms

21 Muslin
Muslin soaked in Compound #7
160

 Edison's Line. 1st. section.

Oct. 14th 1880.

Between wires 21,000. ohms.

Edisons Line. 1st & 2d. section

Bet. wires 4,250. ohms.

Nov. 1. 1880.

Edisons ckt. to box on R. R.
560. ohms. to Davis's 400 ohms
to end opp. lamp fcty. 160. ohms
to end. back of Edisons Barn 260. ohms

Nov. 2d. 1880.

Carmen's ckt. from Dynamo room to Wm. & Thos. Carmen's house direct (side lines &c cut out) 675 ohms.

Same ckt. with only turnpike line in. 240. ohms.

Same ckt. from dynamo room to box at corner of boardwalk 800. ohms.

196 ohms — 22.1 for galvanometer con
time to KK and branch line
insulation test —
17.9 for circuit line
196

Tests of insulation of lines on page 129 made Oct. Nov. 6. '80. after two days soaking rain, and still dripping.

—22 for y per. line
38 Ohms Insulation on line from Dynamo Room to Batchelors corner 325
367. Kruesi line and direct line
199.8 By stable

997 From dynamo. room to corner opp. office
sand line in front of Lab. 997 " "
995 With line Back of Kruesi in.
~~tools same as without~~

From dynamo room to box at Cornishes, 76. ohms.
From dynamo room to box at cor. of board walk this side of Uptons house, 500, ohms.
From dynamo room to Theo. Cornishes house, (side line out,) 490. ohms.
Same, side line in. 494 "

 Galvanometer line 20. ohms

Dec. 2d. 1880.

Insulation of lines.

Edison's circuit,

First section, from dynamo-room to cor. opp. office. High

2d. section, back of Dean's house 1045. ohms.

3d. section, to cor. opp. Kruesi's house, 283. ohms

4th. section back of Kruesi's house 280. ohms

5th section back of Edison's barn. 208.

6th section, to turnpike 283. ohms

Dec 2d. Insulation.
Edisons Circuit

7th section. to Davis hotel.
245. ohms.

8th section, to lamp factory
245. ohms.

Carmans Circuit.

1st section, to box opp. cor. of board walk.

2d. section, to M. Carmens house.
Side lines out.
N. line #1. in.
N. line #2. in
S. line in.

3d. section, to D. Carmens house
Side line out
" " in,

4th. section, to box opp. Uptons corner

5th section to turnpike opp. M.-Carmens house.

Depot line,
Davies line.

R. R., or 6. wire, circuit.

1st section, to box on Cedar St.
Side line out.
" " in,

2d. section, S. on Cedar St,

3d. section, N. on Cedar. St.

Dec. Insulation of lines
Back. circuit, (8. wires)

1st section, direct to first box.

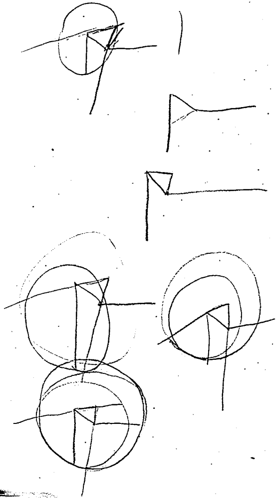
2d. section, E. to Cedar St, with side line always in,

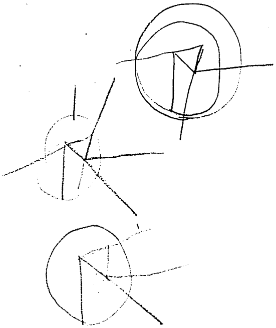
3d. section N. to Carmins, with side line always in,

4th section, to 2d. box.

5th section to Cedar St. E.

6th section N. through Corpers.





~~ert.~~

$c(\cancel{X}+r+q) = c'(R''+r+q)$

$cx + \cancel{cr+cq}\ x = \dfrac{c'R''+c'r+c'q-(cr+cq)}{c}$

$cx \quad cr+cq$

$\frac{1\ 50}{3\ 50}\ 10(\ 10 \quad 20), \ldots$

35

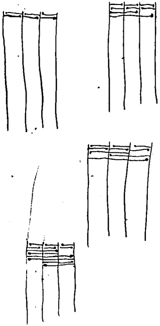
$\dfrac{cx \pm cr + cq = c'R'' + c'r + c'q}{c}$

C

$\dfrac{30}{20}$ $\quad -5-R \quad$ ~~10~~ ~~15~~

1- $\quad$ ~~20~~ $-125{+}25$

$\dfrac{30}{20}$



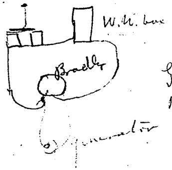
30
50
50
40
190

W. E. Box Generator 400 Ohms
Bell 850 Ohms

6290
2100
8390

500	~~2600~~
	3000
Good	2600
250	2100
150	1200
100	900
70	600
40	200
30	100
20	Rings

Bergmans box



Generator 820 Ohms
Bell 270 Ohms

Bradley		W.U.
00		12500
600	Adjusted	1500
250		1300
150		700
100		500
90		
50		Just Rings

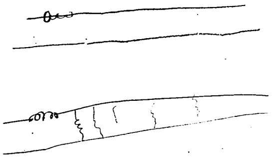
Bergmann's generator on W. E. bells

	15,700 Ohms
500	3400
	2600 again
250	1800
150	~~700~~
	~~1200~~ bells nearer
	1500
100	1200
70	800
50	500
30	200
20	100
12	Rings

W. E. on Bergmann's bell

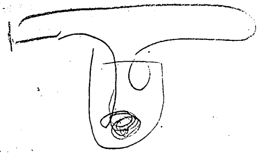
	7000 Ohms
500	3800
	2000
250	1300
150	1000
100	500
70	100
50	
25	Rings

Aug 13 '80 41-41
Aug 14 '80 39½-39½



205 — 16 candles.
2[illegible] — 3[illegible]

~~276~~ —
282 Aug 14-80.



tore out 1 page

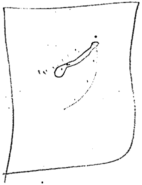
X

$40\frac{1}{2}$

$40\frac{1}{2}$

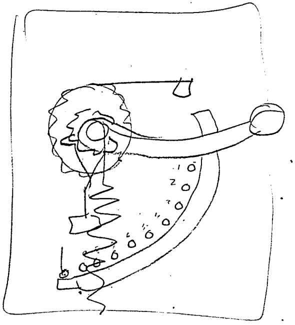
40

~~40~~
89½ Aug 14-80
89½

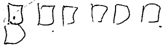


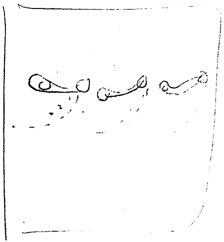
40/120/3
20
60
1.08
4.80
60
64.80

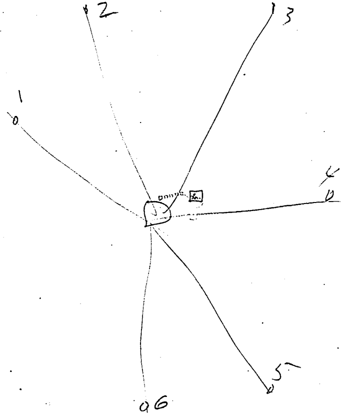
4.

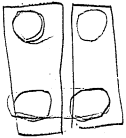


Wm H. & Co $\boxed{28.}$

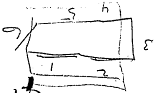





2
3
1
5
6



$$\frac{6}{8} \times \frac{1}{2} = \frac{3}{8}$$



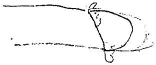
$$e_R + e_r + e_g = e_1(\rho + r + g)$$

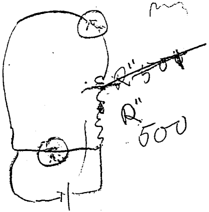
$$R = e_1\rho + e_1 r + e_1 g - e r + e g$$

$$e R = e_1\rho + e_1 r + e_1 g - e r + e g$$

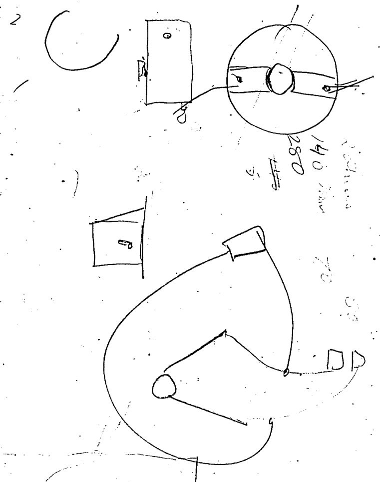
$$+ e_1 g + e g = -e R + e_1 \rho + e r + e r$$

$$e_1 + e$$

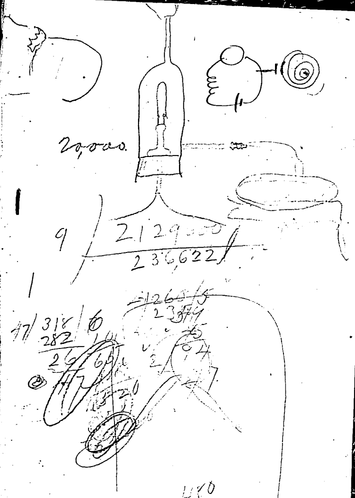




2.37



WE 4500
Berg 1100



2,000.

9 / 2129000
236,622

47 / 318 / 6
282
26

480
65

Menlo Park Notebook #138 [N-80-12-17]

This notebook covers the period December 1880. Each page contains a lamp number and what appear to be numbers measuring the resistance of the lamp. The label on the front cover is marked "Lamps Lot A & B," "1880," and "Francis Jehl." The book contains 284 numbered pages.

Blank pages not filmed: 202-284.

118a
176-176
176
3352
1470

119a

170 – 170

2

3340

113

120a

164 – 164

2

328

109

121ª

178 — 178.

178

3 | 356

118σ

122ª

160 — 160

2

3 | 320

106

123^a

167–167
2

124^a

175–175

125 [a]

172-172.

126 [a]

172-172

127a

175 – 175

128a

178 – 178

129a

164 – 164

130a

158 – 158

131 a
170—170

132 a
174-174

133a

162 – 162

134 a

164 – 164

135 à

163–163

136 a

167–167

137 a

169–169

138 a

167–167

139^a

165—165

140^a

163—163

141 a
173-173

142 a
175-175

143 [a]

172 – 172

144 [a]

180 – 179

145 a

Went up

146 a

160 — 160

147 a

~~169 16~~

168—168.

148 a

169—169

149 a

Went up at the dumps

150 a

200 – 200

151^a

160 — 160

152^a

Went up when it
was put on

153a

154a

170-170

155^a

182-182

~~1175~~

175-175

157 a

165 - 165

158 a

165 - 165

159[a]
168—168

160[a]
180 — 180[a]

161 a

~~151~~–152

Waiting in Phone room

162 a

+ ~~#15~~

163[a]

175–175

164[a]

~~1758~~

175 – 175

165[a]

168 — 168

166[a]

154 — 154

167a

172 – 172

180 – 180

169ª

180 — 180

170ª

180 — 180

171^a

175 – 175

172^a

180 — 180

173ª

162–163

174ª

153–153

175ᵃ

162–162

176ᵃ

171–171

177a

Went up in Phone room

178a

164-164

179^a

166 — 166

180^a

157 — 157

181 a
160 -160

182 a
160 —160

183ᵃ

167 – 167

184ᵃ

155 – 155

185ª

163–162

186ª Aq.

155 – 153

187[a]

160 – 161

188[a]

170 – 170

189ª

160 – 159,

190ª

162 – 162

191 a

160 - 162

192 a

159-160

193^a

164–163

194^a

160–161

195[a]

185—185

196[a]

158—158

197ª

Went up at the
Clangs! no vac

198ª au

158—158

199ª

160-160

200ª Cu

169-169

B1

78 — 78 at 8 Candle

2 B

84 – 83

3^B

80 – 80 – 8 Candles

4

Bustier by How.

5 B

Went up ith the
Phone room

6 B

82-82

7 B.

84 - 84 8 Candles

8 B

Went up at the Club

9 B

80 — 80

$\frac{160}{53}$

10 B

81 — 81 Candles

B 16 82 – 82

✓ B 12 82 – 82

✓ B 23 80 – 80

✓ B 19 79 – 79

✓ B 20 82 – 81

✓ B 21 80 – 80

B 11 80 – 81

B 18 77 – 77 154 / 51

B 15 78 – 78

B 17 85 – 85

B 22 85 – 85

✓ B 14 80 – 80

47 Dec 18

47 Lamps 4 47

A 207 – 242 [illegible]

B 16 – 23 [illegible]

Vulcanized fiber Lamps 3
47

201 a

165–165

202 a

165–165

203 a

170 — 170

204 a

~~157 — 157~~

~~another~~

204

155 — 158

205 a

~~175–175~~

another

162–162

206 a

~~162–162 *~~

another

167 – 167

207^a

165—165

208^a

175—175

209 a

165–165

210 a

165–165

211 a

168—168

178—178

213a

175 – 175

172 – 172

215a

177 — 177

165 — 165

217 a

162–162

218 a

165–165

219 a

160 — 160

220 a

168 — 167

221a

170—170

222a

165—165

223a

180 — 180

224a

173–174

225 a

157 – 157

226 a

165 – 165

227a

160 – 160

163 – 164

229a

163–163

230a

158–158,

231[a]

155—155

232[a]

184—184

233a

150-150

234a

155-155

235 a

Cu
158-157

236 a Cu

155-155

237a

150 — 150

238a

166—166

239a

165 – 165

240a

165 – 165

241a

163-163

242a

164-164

243a

175 – 175

244a

158 – 158

245

167—167

246

~~167—167~~

166—166

247a

158-158

248a

167-167

249a

170 — 170

250a

155 — 155

251a

~~158~~
159—159

252a

~~158—158~~
173—173

Dec 17 1880

Vulcanized fiber

170 – 170 (Z)
2
3 | 340
113

Vulcanized fiber

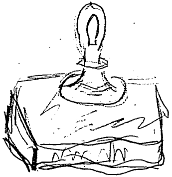
178 – 178
2
2 | 356
118

Dec 17 1880

Vulcanized fiber

165 – 165 (X)

110



Vulcanized fibers (W)

170 – 170

340

113

Vulcanized fiber (V)

170 – 170

$$\frac{340}{2} \quad 3)\overline{340} \quad 113$$

~~Dec~~ 18

Vulcanized fiber

1.66 – 166.

$$\frac{336}{2} \quad 3)\overline{336} \quad 112$$

253 a

163-163

163-163

255 a

153 – 153

256 a

170 – 170

257a

165–165

258a

158–158

259ᵃ

167–167

260ᵃ

164–164

261 a

165-165

262 a

163-163

263a

167-167

264

154-154

265-a

170-170

266a

158-158

267

Went up in Phone room.

268.a

164—164

269 a

171-171

270 a

175-175

271a

164 — ~~164~~

272a

156 – 156

273 a

172 . 172 ,

274 a

159 - 159

275a

153 - 153

276a

153 - 153

277a

160 — 160

278

165 — 165

279a

174-174

280a

174-173

281^a

158-158

282^a

261-261

283a

158–159

284a

/ 165–165

285a

164–164

286a

155–155

287a

172-172

288a

162-162

289[a]

160—160.

B26

85—85

B-24

88—88

B – 33

85 85

B – 13

90 – 90

B – 27 – 27

~~f~~ 85 – 85

85

17

56

B – 28 – 28

85 – 85

B-34-
81-81

B-32-
85 85

B-30-
85-85

B-31
87-87

B_25 88-88.

a 17

172^a

185–185

---

a
212

175–175

---

a 190

170–170

232^a

180–180

171^a

169–169

243^a

169–169

188^a

165–169

186^a

165–165

113^a

185–185

182ª

168 – 168,

187ª

185 – 185

191ª

163 – 163

~~215ª~~ 208

180 – 180

---

no of lamps	defective
313	175
320	165
325	166
329	162
[illegible]	[illegible]2
326	162
321	166
316	[illegible]
31[illegible]	[illegible]
306	165
30[illegible]	163
3[illegible]9	160
314	165
323	165
333	169
327	169
331	165
334	169
319	165

Menlo Park Notebook #139 [N-80-01-07]

This notebook contains two pages of entries, dated January 7, 1880. The entries are by Charles Batchelor and consist of notes and drawings for carbon spiral lamps. The book contains 284 numbered pages.

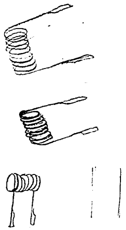
Blank pages not filmed: 4-284.

Jan 7 1880

6 Spiral lamps for Edison

Made 1 Carbonizing mould
3 Screws for winding Spirals

took 30 fibres



Menlo Park Notebook #140 [N-80-12-21]

This notebook is undated with the exception of one entry for December 21, 1880. It was kept by an unknown member of the laboratory staff and was used primarily to record cable codes for shipments of bamboo. The book also contains a copy of the "instructions given to Messrs. Russell & Co - Hong King and Canton." The label on the front cover is marked "Cable Words." There are 284 numbered pages. Only the instructions have been filmed.

Copy

Instructions given to
Messrs. Russell & Co.
Hong Kong and Canton

Please procure musters
of all Bamboos of which
an unlimited supply
can be obtained, to combine
the following requirments

1st To have a very hard
and dense fibre or
wood on and near
the outer edge —

2nd The joints should be
as straight as possible

3rd Should measure
not less than nine
(9) inches in length
between the divisions

and not less than
four (4) inches in
circumference

4th Top of poles should
not be used as
the wood is not
so hard or dense as
when cut from the
lower or middle
portions of the poles

5th Lowest price for
poles cut into con-
venient length for
shipment say 6 or 8 ft.
also give average
circumference of
same -

Bamboos should be clean, well seasoned and free from insects

6th Lowest price for poles sawed between joints and split in halves

Length of joints 8 in. per 1000
do " " 10 " " 1000

State average circumference

7th Lowest price of poles cut up into fibres
Size 8 in. long x $\frac{3}{16}$ in. per 1000
" 10 " " x $\frac{3}{16}$ " " 1000

In lots of 100.000 to 1000.000 per month

8th State all charges for packing, shipping etc

Borneo and adjacent islands

Fiber of Cocoa-nut, betel, sago and gomati — used to make Cordage

Celebes and adjacent islands

Bamboo grows to heighth of 40 feet

Menlo Park Notebook #142 [N-80-11-27] (NOT FILMED)

This notebook covers the period November-December 1880. It was kept by an unknown member of the laboratory staff to record shipments of bamboo. The book contains 284 numbered pages. Approximately 10 percent of the pages have been used.

Menlo Park Notebook #143 [N-82-11-14]

This notebook covers the period November 1882-June 1883. The entries are by George Gibbs and Thomas P. Conant and relate primarily to chemical experiments. Included are notes and a few drawings concerning experiments to produce marks on paper, probably for an electric meter. There is also material pertaining to storage batteries, carbon filaments, cements for sockets, and mica insulation for dynamo brushes. The last half of the book is by Conant alone and relates to electric meter experiments. The book contains 284 numbered pages.

Blank pages not filmed: 1, 274-281.

Missing page numbers: 69-72.

Experiments with Oil of Aniline. Nov. 14th /82. J.J.

Failed to obtain a solution in Oxalic Acid (either in the hot or cold) containing perceptible traces of the oil.

No solution with Salicylic Acid.

No solution with Boracic Acid

Obtained a solution with Sulphuric Acid and tried the following combinations with the results given below.

H_2SO_4 sol. alone — no mark.

+ NaCl — " "

" + $Co(NO_3)_2$ — " "

H_2SO_4 sol. + ~~Iodide~~ of Ca " "

" Sesquichloride of Fe " "

" Cyanide of K " "

(over)

H_2SO_4 sol. + Acetate of Hg – no mark
" " + Protochloride of Fe " "
above + $Co(NO_3)_2$
H_2SO_4 sol. + Carbonate of Mn " "
above + $NaCl$
H_2SO_4 sol + $MnCl$ " "
above + $Co(NO_3)_2$ + $CuSO_4$ " "

Obtained a solution with Hydrochloric Acid, but could not get a mark on the paper. The following compounds were tried:
HCl sol.
above + Bromide of Sodium
" + chloride of Cobalt
$NaCl$ + " " "
Sesquioxide of Lead.
Sesquichloride of Iron:
Chloride of Copper.

Nov 15 /42 J. P. C.

Acetic acid Solution
formed slowly in the cold
easily upon application of
heat. Current
derived from four quart
cells (bichromate) in series,

Solution alone gives fairly
distinct mark up to 2500
ohms.

With addition of Salt
gives same mark up to
about 3000 ohms

With Salt and Chloride
of Cobalt gives good
black mark up to about
3000 ohms

With Chloride of Cobalt
gives about same result
not so distinct however.

With Chloride of Cobalt and
Chlorate of Potash gives good
black mark up to 2500 ohms

With same plus salt. mark
fairly black up to 2000 ohms

With Chlorate of Potash
gives fairly distinct mark
up to 2500 ohms.

Same plus salt gives about
same result.

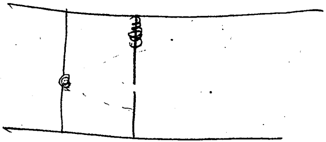
With Sulphate of Lead
gives fair mark up to
2500 ohms.

With Bromide of Sodium
x faint mark to 2000 ohms

x Red oxide of Lead gives
good mark up to 2000 ohms

Same plus salt gives
much darker mark up to
2000. ohms

- Tartrate of soda - no result
Bisulphite " - " "
Hyposulphite " - " "
Sulphate of Potash - " "
Caustic " " - " "
Chromate " " - " "
~~Chromic oxide~~ - " "
Chloride of Mercury - " "
acitate " " - " "



Sulphate of Iron - no result
Citrate of Iron & ammonia - " "
Chloride of Manganese - " "
Protochloride of Tin x - " "
Phosphoric acid - " "
Cobalt Nitrate x - " "
Dextrine - " "
Each of above + salt - " "

Carbonate of copper gives black mark up to 2500 ohms and faint mark up to 15000 ohms

---

Same plus salt gives much clearer results up to same figures

Plus salt and chloride of Cobalt gives better results (same resistance

The marks obtained by use of the acetic solution become intensified by action of light and the strips of paper become somewhat yellow

---

Chromic oxide - good result
" " + salt " "

Nov. 15th/82 George Gibbs

Obtained no results with a solution in Pyrogallic acid,

Obtained a solution in Nitric Acid, with the following results:—

NHO_3 sol.			none
"	"	+ Bichromate K	"
"	"	+ Iodide K	fair ppt
"	"	+ Ferrocyanide K	none
"	"	Cyanide K	"
"	"	NaCl	"
"	"	+ NaCl + Ferrocyanide K	"
"	"	" Cyanide K	"
"	"	+ Potassium Chlorate	"
"	"	+ Bisulphite Na	"
"	"	+ Bromide Na	"
"	"	+ Ammonium Oxalate	"
"	"	+ $(NH_4)HS$	"
"	"	+ $(NH_4)Cl$	"
"	"	+ $MgCl$	"
"	"	+ $HgCl$	"

(over)

HNO_3 sol. + $PbSO_4$ none
" " + $(NH_4)_2Cu(SO_2)_2$ "
" " $CuSO_4$ "
" " $ZnSO_4$ "

Solution in Tartaric Acid (boiled). —

Solution alone gives faint mark up to 3000 ohms, but fades rapidly on exposure to light. — — — — —

Solution and NaCl; — about the same result — faint and worthless.

With Chloride of Cobalt; — faint up to 2000 ohms. Green.

With $KClO_3$ gives good green mark up to 3000.

With acetate Lead gives faint green mark up to 3000 ohms.

Solution of Ferrocyanide of K. gives faint green mark, but with little contrast, the paper being green itself.

Carbonate of Copper gives green mark with whole resistance in (some 15-000 ohms).

Carbonate of Cu. and oxalate of Ammonium give same result.

Sulphate of Copper — same result.

Sesquichloride of Iron gives a very faint mark on dark colored paper.

Protochloride of Tin gives no mark.

All of the above fade rapidly upon exposure to light.

Succinic Acid Solution.

No results obtained, with various combinations, through 15000 ohms.

Experiments with Molasses

No result with aqueous sol.
when treated with various
compounds.

Experiments with Nitro-
-Benzol Nov 16/92 J. P. L

With acetic acid, no
solution.

With sulphuric acid no
solution

With Hydrochloric Acid no
solution. —

Experiments with Dextrine
water + acid solution
gave no results whatever

Nov 16th 18[illegible] [illegible]
Experiments with Anthracene.

No solution the acids.
It was oxidized by a mixture of H_2SO_4 and potassium bichromate, but made no mark.
No mark with the above + $NaCl$, or $KClO_3$ or $CoCl$.

Paper soaked in starch and iodide of Potash gives good results which however are not permanent as the entire strip upon exposure becomes highly colored

The addition of a chloride prevents this but also has an injurious effect on the mark causing it to fade after a time

The best results are obtained by the addition of $KClO_3$

$NaCl$ - not permanent
KCl - " "
KNO_3 - good result
Carbonate of soda - not permanent

Nov. 14th/82. G.G.

Tried HCl & indigo, but could get no mark. —

Acetate of Lead solution on paper gives dark mark, but is slow and of high resistance. Nitrate of Lead solution is much better giving a fine black mark up to 1500 ohms, but is slow. —

Nitrate of lead and chloride of cobalt gives a faint mark of no practical use.

Acetate of lead + KI gives a mark which fades quickly.

$PbCl_2$ gives no mark, also litharge, PbI_2 or PbS_2. —

Bichromate of potassium; — no result; also Bichromate with $CaCl_2$ or with $KClO_3$, or sesqui-chloride of iron. —

Failed to get $CrCl_2$ on paper, or CrO. —

No result with Chlorides of Cobalt. Failed to obtain cobaltic oxide (Co_2O_3) (black), on paper by liberating Cl with mixtures of cobalt salts.

Tried cobalt salts ammonium Sulphide with strong acid. Chloride of tin and sulphate of sodium is no good, also nitrate of potassium.
Nitrate of Strontia, also floss $KClO_3$ (no mark.) Also Peroxide of Lead. Acetate of mercury. Oxide of cobalt + with $KClO_3$. (0) Sulphate of potassium + with ferrocyanide of iron. Sulphate of lead in solution in nitrate of ammonium.

Nov 20/14 - J.P.A.

Ferrous salt + KCNS when oxidized gives red mark but not permanent - the action is not improved by addition of other salts.

Acetate of Mercury and sulphate of iron - no result. Antimonic acid alone + with NaCl - no result.

Protochloride of Tin alone — nothing! - with ferrocyanid of potassa — blue marks on face blue paper

Sulphate of iron Nov. 21/82 J.P.L. - no result

" " $+ KClO_3$ - " "

" " $+ NaCl$ - " "

" " + Pyrogallic acid " "

mixture of above " "

Nitrate amyl Nov 22/82 J.P.L. - no result

" " $+ FeSO_4$ " "

" " $NaCl$ " "

" $+ NaCl + KClO_3$ " "

" + " + " $+ FeSO_4$ " "

+ sugar alcohol "

" + " $+ FeSO_4$ "

" $+ CoCl_2$ "

" + " + sugar alcohol.

Nov. 22nd /82 Ferrocyanide of potassium E.G. +

$KClO_3$ gives quite good green marks on white paper, up to 1500 ohms resistance, permanent. This was the best green mark obtained with various combinations mentioned below. The following also give green marks:—

Ferrocyanide of K + KCl
" " + NaCl
" " + KNO_3
" " + KNO_3 + $KClO_3$
" " Bromide Soda.

Tried the following with results given:—

Ferrocyanide + KCl + NaHO. (none)
" K_2SO_4 (")
" $CaCl_2$ (")
" + $KClO_3$ + Hyposulphite K (fades)
" $KClO_3$ + Chromate K (poor)
" $BaCl_2$ (")
" $CoCl_2$ [precipitate on (blue paper)
" HNO_3

Nov 22/82 J. P. C.

aniline Purple

H_2O solution + $CaCl_2$ - blue

" " + Na Hypo - no change

" " + KNO_3 - " "

" " + NH_4NO_3 - " "

Black aniline - no results

Nov. 23rd /82. — George [illegible]

Experiments with Aniline purple. — H_2O solution with NaCl — faint green mark on purple paper when small quantity of salt was used, but no result when enough NaCl was used to reach the solution.

Aniline sol. and ferrocyanide of potassium gives green mark on purple paper up to 1000 dim.; but is slow and not very permanent!

Tried aniline solution with varying proportions of ferric chloride — in all ten samples — Obtained ~~soluble~~ with small proportion of chloride a pale green mark on purple paper. With large proportion of ferric chloride got green mark on green paper. All these marks fade after two or three hours exposure in sun.

Sulphate of Iron precipitates the coloring matter from the aniline solutions.

Nov 23 /82 J. P. C

H_2O sol blue flag - no result
" " + $KClO_3$ - " "
" " + " + NaCl - " "
" " + $NiNO_3$ - " "
" " + oil of aniline " "
" " + Pyrogallic acid - faint

H_2O sol Brazil wood
alone + reducing current - blue
" + oxidizing " - white
+ NaCl - more sensitive
+ $KClO_3$ - " "
+ KNO_3 " "
+ NaCl + $KClO_3$ " "
+ K ferro cy - faint blue
+ $FeSO_4$ - no result
+ " + NaCl " "
+ Na_2CO_3 " "

Not permanent

H_2O sol Brazil wood

" + CaI - no result

acetate of Co - " "

" + " + $HC_2H_3O_2$ - " "

Decolorized with peroxide of Lead and tried to restore by current - no result

H_2O sol + alum - no result

" " + $CuSO_4$ - " "

" " + " + NaCl - " "

" " + Cu acetate - " "

" " + Cu salts + alum - " "

" " + ZnO - " "

Nov. 23rd/82 G. G.

Experiments with "Dye Wood".
Tried solution of dye-wood in H_2O alone and with Ferric chloride - no result. —
I find that "dye-wood" gives faint reactions, not as marked as with "brazil-wood" but similar in color &c. ——
A Solution of Acid tear! in H_2O when treated with NaCl and $KClO_3$ gives a fine pale yellow mark on red paper with oxidizing ~~paint~~ platinum point, but the colors rapidly fade ——
Tried Oil of Organum with acetic acid, nitric, hydrochloric and sulphuric, but failed to get a complete solution or the faintest mark with NaCl or $KClO_3$ or $COCl_2$ &c. ——
~~Tried Carbonate of Iron in H_2O — no result.~~ —

Nov. 23rd G. G. —

Tried a solution of copper sulphate and acetic acid thru potassium carbonate; — no mark.

Also solution $CuSO_4$ and acetic acid + $NaHO$ — no result.

Nov 24/82 J. P. C

H_2O sol Brazil wood + acetate of Al — no result
same + tartaric acid — " "

Napthalin sol in H_2O + alcohol no result
" " " " + NaCl — "
" " " " + $KClO_3$ — "
" + NaCl + " — "
" + $KClO_3$ + $CoCl_2$ — "
" + Brazil wood — "

Nov. 24th/82. G. G.

Tried $CuSO_4$ with tartaric acid
then $CaCO_3$ — no result.
Tried Cupric Sulphide dissolved
in potassic cyanide — no mark.
Tried black oxide of copper
dissolved in HCl, or cupric c—
chloride; obtained a black dot
when point was held on paper
for a moment (with no re—
sistance in) it faded out —
almost immediately. —

Tried Hyperoxide of manganese
in H_2O. with reducing current —
obtained a black mark, but found
it very slow, as in the case of
blk. oxide of Cu above.
Tried Acetate of manganese
in H_2O — a faint mark obtained
(n.g.) — Also acetate of Mn +
NaCl — faint and not sensi-
tive.
Tried Carbonate of Iron in
water — no result.

Nov. 24th/82. George Gibbs.

Tried Manganous Chloride in H_2O. got a fine mark on white paper up to 2000 ohms resistance. Both the mark + color of paper are permanent. Tried above solution with NaCl with about the same result, also with $KClO_3$, the same. With Potassium nitrate — about the same — not more sensitive. With nitrate of ammonia — the same; with $(NH)_4NO_3 + NaCl$ — no perceptible difference. Last exp. + $CoCl_2$ — no improvement.

Nov. 25th/82. — G. G.

Tried Bi-sulphate soda added to $MnCl_2$ solution — no mark. —
Sulphate of potassium + $MnCl_2$ sol. — no mark.
$MnCl_2$ sol. + $(NH)_4SO_4$ — no mark.
Sol. with $CuSO_4$ — increased sensitiveness, getting a faint mark through

Nov 25 /12 ~~J. A. L.~~ G. G.

whole resistance, but paper turned green and mark disappeared after a while.

Tried Sol. with Sulphate of Iron. got a good mark (with low resistance), but it faded immediately.

Tried Sol. with Sulphate of Zinc. Got a very good mark through whole resistance. Perfectly permanent & on white paper.

Nov 27 /82 J. P. C.

Brazil wood sol in H_2O & $HC_2H_3O_2$ - no result
same sol + $CaCl_2$ - " "

Tannate of Iron

Tartaric acid solution - 0
" " + $NaCl$ - 0
" " + $NaH_3C_2O_2$ - 0
" " $NaCl$ + " - 0
" " + $NaBr$ - 0
" " + " + $NaCl$ - 0
" " + Bisulphite Na - 0
" " + Pyrogallic acid - 0
" " + " + $NaCl$ - 0
" " + $NaHPO_4$ - 0
" " + $KCNS$ - red fades
" " + " + Pyrogallic acid - "
" * + NH_4NO_3 - 0
" " + acetate Al - 0
" " + $MgCl$ - 0
" " + Protochloride Sn - 0
" " + $Pb(NO_3)_2$ - 0

Nov 28 /82 J. P. C

$Cu(C_2H_3O_2)_2 + NH_4Cl + ZnO$ - 0

Fustic H_2O sol alone - 0

" " " + NaCl - faint yellow

" " " + " + alumina acet - "

" " + alum + sodium tart 0

" " + " + $SnCl_2$ 0

Brazil wood H_2O sol

" " + Ferri Tannic + $SnCl_2$

gave red paper - blue streak, fading

Chloride of Platinum - 0

" " + NaCl - 0

" " + " + $KClO_3$ - 0

" " + NaBr - 0

Nov 29 /82 J. P. C

$Mn(SO_4)$ H_2O sol-sat- 3000 ohms
" + H_2SO_4 - faint all
" + $ZnSO_4$ - " "
" + Bisulph Na - 0
" + $NaCl$ - 3000 ohms
" + $KClO_3$ - 2500 "
" + KNO_3 0
" + $Pb(NO_3)_2$ - 2500
" + $PbSO_4$ - "

The mark from the $Pb(NO_3)_2$ seems to turn darker with time that from the $PbSO_4$ not changing

Dec 1 / 82 J. P. C.

$Mn(SO_4)_2 H_2O$ - sat sol

with $CuSO_4$. - 2500 ohms

" $Pb(NO_3)_2$ and

some $PbSO_4$ which forms

on the paper - 3000 ohms

faint up to 10000 ohms,

+ $FeSO_4$ - no result

+ $BaSO_4$ (formed on paper)

up to 1500 ohms

Experiments with Cement:—
Saturated solution of chloride of magnesium; and magnesia (MgO).—
I find that one part by weight to one part by volume is about the maximum quantity that will be absorbed. This forms a thick paste, and will set and become very hard in 12 hours. A less number of parts by weight may be used, but will require longer time in setting.

This cement will harden with from 15 to 20 times its own weight of [illegible]
[illegible]

Experiments on storage battery
Two plates of Cu in HCl sol
of I
also two Cu cylinders in
porous cups containing I sol
in Na_2CO_3 - cups being in
glass vessel containing
Na_2CO_3 sol

Dec 4 J. F. O

Made up sol of
acetate aniline + $NaCl$ +
$KClO_3$
also
$MnSO_4$ for test
of paper in printer

Dec 5 T, P, C

Experiments on cements
Sat sol $CaCl_2$ + slacked lime
made test plates and
also coated wires
sat sol $ZnCl_2$ + ZnO
as above
The difficulty is with
these that they crack off
when dry

Dec 8 T. P. C.

Took the following solutions (cold) and placed wires in them

$NaOH$ – no coating

Na_2HPO_4 – " "

$NaBr$ – " "

$Co(NO_3)_2$ – coating (not insulating)

Hg acetate – no coating

NH_4Cl – " "

arsenious acid – coating (not insulating)

I – " "

K_4FeCy_6 " "

KCy – " "

$MgCl_2$ – coating partly insulating

$CaCl_2$ – " "

The previous tests repeated but with about same results

Tried to obtain coating by electrolysis using same solutions
The trouble is that the coatings crack off on drying
The best result is from the $CaCl_2$ sat sol which forms caustic hydrate of lime giving a good insulation which however will peel off on drying
(The CaOH forms on the cathode)

Dec 11 - J. P. C 49.

Tried waterglass
This insulates well and is elastic
Tried fluoride of calcium
- no good - subs. J.F. -
The water glass does not stand a red heat and would not fuse on the wire but instead swelled and cracked off owing to burning of the Na.

Dec 12 J. P. C 400

Wire insulated by silk was soaked in tungstate of soda the object being to render said insulation fire proof. The result was unsatisfactory as the coating became charred and rubbed off.

Tried asbestos paint but could not dry it on the wire

In attempting to dry by heat the oil would burn out leaving a coating of asbestos which although a good insulator, cracked off easily

Tried the following fluxes:—

1)	Flint-Glass	10 Wt.
	White Arsenic	1 "
	Nitre	1 "
2)	Red Lead	1 "
	Flint-Glass	3 "
3)	Red Lead	1 "
	Calcined Borax	1½ "
	Flint-powder	2
	Flint-Glass	6 .

These were fused and then powdered. A paste was made of the powder and the wire coated with this.

It did not succeed well, as the paste rubbed off, and if the wire was heated so as to fuse the paste, the temper was taken out.

Dec 13 J. P. C.

Chromate of K gave by electrolysis a coating on the wire which did not insulate.

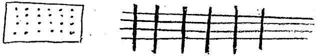
$(NH_4)_2SO_4$ = same result.

KNO_3 = no result

oxalate of K = good insulation wire a less elastic but not capable of withstanding a red heat

Dec 17th G.G.—

Tried mica insulation for brushes as follows;—



A number of holes were punched in mica plates, and wires comprising brush pushed through them as shown.—

Dec 15 /82 J. P. C

cemented plates of Mica with $MgCl_2$ + MgO

Dec 19 /82 J.P.

Made lamp-socket of $MgCl_2$ sat. sol + MgO (good)

Dec 20 / 86 J. P. C.

Made up following cements.

1. 5 c.c. sat sol $MgCl_2$
1 gm MgO
10 " chalk fair

2. 5 c.c. sat sol $MgCl_2$
1 gm MgO
15 " Fine clay (quartz)

3. 5 c.c. sat sol $MgCl_2$
1 gm MgO
17 " Feldspar
good but slow

Dec 20 (continued) /82

J. P. C

4 5 c.c. sat sol $MgCl_2$
1 gm MgO
10 " Pon. Kaolin

5 5 c.c. sat sol $MgCl_2$
1 gm MgO
10 " Silica
slow - fair

6 5 c.c. sat sol $MgCl_2$
5 " Glue H_2O
10 gm MgO
bad!

Dec 21 /82

J. P. C

7 5 c.c. sat sol $MgCl_2$
2 gm MgO
10 " chalk
fair

8. 5 c.c sat sol $MgCl_2$
2 gm MgO
15 " clay
good

9. 5 c.c sat sol $MgCl_2$
2 gm MgO
slow good

Made lamp. socket
20 c.c - sat sol $MgCl_2$
10 gm MgO.
good.

Dec 21 (cont.) /02

J. P. C.

1/ 10 c.c. sat. sol. $MgCl_2$
10 gm (good result) MgO

2/ 10 c.c. sol ($\frac{1}{5}H_2O$) $MgCl_2$
10 gm (good result) MgO

3/ 10 c.c. sol ($\frac{1}{10}H_2O$) $MgCl_2$
10 gm (good) MgO

4/ 10 c.c. sol ($\frac{1}{3}H_2O$) $MgCl_2$
10 gm (fair) MgO

Dec 21 cont. Add 2 J. P. L.

5/ 10 c.c sol ($\frac{1}{2}H_2O$) $MgCl_2$
10 gm (fair) MgO

6/ 10 c.c sol ($\frac{3}{4}H_2O$) $MgCl_2$
10 gm (no good) MgO

7. 10 cc H_2O
10 gm (no good) MgO

Dec. 22 /82 J. P.

5 c.c. sat sol $MgCl_2$
3 gm MgO
7 " Silex
good. slow

5 c.c. sat sol $MgCl_2$
5 gm MgO
5 c.c collodion
bad.

5 c.c. sat sol $MgCl_2$
5 gm MgO
2 c.c. Linseed oil
bad

Dec 22 continued /82 J. P. C

5 c.c. sat sol $MgCl_2$
2 grm MgO
5 " Phosphate Lime
fair

Tried to form a cement with mixture of slaked lime. This was a failure as the lime would not mix in but made the cement very granular

5 c.c. sat. sol. $MgCl_2$
2 grm MgO
11 " Feldspar
good

Dec. 20/82
J. P. C

5 c.c sat sol. $MgCl_2$
4 gm MgO
5 " Silicon
good

Lamp socket
20 c.c $MgCl_2$
20 gm MgO
(Good)

Dec. 26 /82.

J. P. C

cement of $MgCl_2$ + MgO + glutin (rough experiment) N.G.

Made experiment of depositing carbon upon carbon filament in benzine oil by means of spark from arc carbon and by heating to incandescence

---

Dec 27/82

T. P. C

Lamp socket

30 c.c - $MgCl_2$ ($\frac{1}{6}$ H_2O)

10 gm - MgO

6 " Burnt alum

N. G.

Jan 2 /83
3. P.M.

Plug
30 c.c. sol $MgCl_2$ (5 H_2O)
8 gm MgO
5. " Silicon
[illegible] not found

Cement
$MgCl_2$ (5 H_2O) + MgO
+ $CaCl_2$
to test drying properties
of the chloride.

N. G

Jan 2 /80

J. P. C

cement

10 c.c. $MgCl_2$ ($\frac{1}{3}$ H_2O)
5 gm MgO
15-20 " $CaCl_2$

set rapidly but
remained wet on the
surface

Note. This cement after
standing for several
weeks went all to
pieces.

Jan 3 / 89

J. P. C.

Cement

10 c.c. sat sol. $MgCl_2$

5 gm MgO

14 " soapstone

F (a little soft)

Jan 4/03 [illegible]

Trying these three

10 c.c. sat sol $MgCl_2$
7 gm MgO
14 " soapstone.
F good

10 c.c. sat sol $MgCl_2$
5 gm MgO
20 " soapstone
F good

10 c.c. sat sol $MgCl_2$
5 gm MgO
22 gm soapstone
F good

10 c.c.
10 gram. Oxide mag

Jan 4/83

3. P. C.

10 c.c. sat sol $MgCl$
9 gm MgO
8 " Soapstone

(Very good)

10 c.c. sat sol $MgCl_2$
10 gm MgO
10 " Soapstone
15 " (good) Feldspar

10 c.c. sat sol $MgCl_2$
5 gm MgO
5 " Soapstone
5 " (poor) Kaolin

Jan 4 / 83

3, P, O

10 c.c. sat sol $MgCl_2$

6 gm MgO

5 " soapstone

5 " Feldspar

5 " Kaolin

poor

Jan 5/13

J. P. C.

10 c.c. sat sol $MgCl_2$
5 gm MgO
10 " $CaCO_3$

good - slow

Jan 6/87

J. P. C.

socket

20 c.c. sat. sol. $MgCl_2$
18 grm MgO
16 " soapstone
very good

Jan 8 / 83

J. P. L.

15 c.c. sat sol $MgCl_2$
7 gm MgO
11 " soapstone
II slow

15 c.c. sat sol $MgCl_2$
5 gm MgO
20 " soapstone
IIII slow

15 c.c. sat. sol $MgCl_2$
5 gm MgO
22 " soapstone

V slow

Jan 9 /83 J. P. C

20 c.c. sat sol $MgCl_2$
7 gms MgO
14 " soapstone
(Good)

---

20 c.c. sat sol $MgCl_2$
5 gms MgO
20 " soapstone
(Good)

---

10 c.c. sat sol $MgCl_2$
3 gms MgO
20 " soapstone
10 " feldspar
(Good)

Jan 9/83
J, P, C

10 c.c. sol ($\frac{1}{3}H_2O$) $MgCl_2$
5 grs MgO
20 " soapstone
(slow)

Socket-
20 c.c. sat sol $MgCl_2$
10 gm MgO
20 " $CaCO_3$
5 " soapstone
(good)

10 c.c. sat sol $MgCl_2$
2 grs MgO
12 " Plaster Paris
slow gritty

Jan 10 / 83

J. B. C.

10 c.c. sat sol $MgCl_2$
5 gm MgO
14 " Plaster Paris
fair.

---

10 c.c. ~~sat~~ sol ($\frac{1}{3}$ H_2O) $MgCl_2$
5 gm MgO
15 " Plaster Paris
fair.

Plug
25 c.c. sat $\frac{1}{3}$ H_2O $MgCl_2$
10 gram MgO
" fair Plaster Paris

Jan 31 / 83

taken	result
20 c.c. conc H_2SO_4 —	partial
" + 1 c.c. H_2O	"
" + 2 " "	"
" + 3 " "	"
" + 6 " "	good (very)
" + 7	
" + 9 "	partial
" + 12 "	saponification
" + 4 "	good
" + 5 "	"

20 c.c. H_2SO_4 to (4 to 7) c.c. H_2O is best

Note. above was a trial on parchmentizing

J. P. Conant

Feb 24 /20

Experiment to prevent oxidation of Zinc water plates.

Standard sol.
3 1/2 Kilos $ZnSO_4$ to
35 liters dist H_2O

Tried the following

standard sol + 2 % glycerine
" " + 5 " "
" " + 15 " "
" " Boiled
" " + Zn amalgam

J. P. Conant

Feb 26 /13.

Pptd + NH_4OH and redissolved ppt in "

added $HC_2H_3O_2$ till slightly acid

exposed of alum
200 c.c standard sol + 1 gm dextrine
" " " + 2 " "
" " " + 4 " "
" " " + 1 gm of Pyrogallic acid

Tried also alkaline sol of pyrogallic but always found a precipitation on adding to solution

J. B. Conant

Feb 27 /83

200 c.c. stan. sol. + 1 gm sugar
" " " + 4 " "
" " " + 10 " "

Placed copper turnings in bottom of jar also pure tin.

$FeSO_4$

Boiled and covered with a olive oil b Turpentine. c castor oil d cubeb oil

Plated Zn on amal Zn and then reamal. the

plate was then suspended 149
in sol

Tragacanth

alcohol

Brazil wood sol

sugar alcohol

sulphuric Ether

sulphate Morphine

J. P. Conant

Feb 28 1879

Sol boiled and covered with collodion

German silver turnings placed in sol

Made Commutator of Mg cement | for Motor

J. P. Conant

Mar 1 /13

Sol. boiled and covered with oil of origanum

Turmeric sol added

Naphthalin "

Chloral Hydrate "

J. B. Conant

Mar 2 /81

Placed in sol a large plate = 4 times surface of smaller

$PtCl_2$

CS_2

$H_2K_2Sb_2O_9$

Spongy lead placed in bottle (not in contact)

~~same result~~

also antimony

Mar 2 /83 (continued)

Sol boiled and covered with oil aniseed

---

also with oil lemongrass

J. P. Conant

Mar 3 /83

Experiment to determine loss of weight of plate due to action of

a. alum.
wt of plate = 42,419 gms
" " alum = 0.7625 "
300 c.c. standard sol

b. acetic acid
wt of plate = 85,6655 gms
acet acid - 3 c.c
300 c.c. stan. sol

Sol boiled and covered with art white thymus.

NH_4Cl added

added creosote

Sol. boiled & covered with oil of Tansy

added NaCl

J. P. Conant

Mar 5/80

Experiment to obtain a glass from substances free from alkali

---

Litharge — no good

J. U.

(over)

Mar 6 /83

Sulphate Lead + SiO_2
works fairly

Silico fluoride Barium
alone + + SiO_2 - good

Sulphate of Lead alone
+ + SiO_2 - works well
but requires a high temp.

Carbonate of Lead
works very well and
fuses in bunsen flame

T. B. Conant

Mar 8 /13

Metin Experiment

sol pust acid + acetic acid
wt of plate = 85.694 gms.

---

300 c.c. stan sol
wt of plate - 82.478 gms
alum - 2 gm

Phosphoric acid

KCy = precipitates
oxalic acid "

J. B. Conant

Mar 10 / 13

Experiment having for its object the coating of a carbon with lime

The following solutions were tried the electrodes being thin rods of carbon.

calcic hydrate
" anhydride
" carbonate
" acetate
" chloride +
" sulphate
" succinate
" oxalate (in HCl)

J. B. Conant

Mar 12 /83

(Metre) wt of Plate = 45.6862 5 gms

solution rendered strongly acid by acetic acid

For coating carbon.

Magnesium chloride – 0
" Nitrate – 0
" Sulphate – 0
" acetate – 0
" Citrate – 0
" Calcium aft sugar sol 0

Carbolic acid in Metre

Tartaric acid "

Citric acid "

Mar 12 /83 continued
(Melin)
Borax = ppt.

added Na_2SO_4

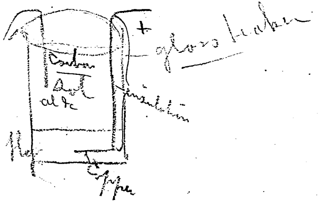
" Chromic acid

" $ZnCl_2$ {very little

Thomas P. Conant

Mar 13 /83

For plating carbon;
sol of aluminum sulphate
+ NaCl -



also same with no
NaCl

also al sulph with
two carbon electrodes

acetate of aluminium
chloride " "
oxalate " cerium in HNO_3

Coated inside part (clamps wires &c) with thick solution of gum tragacanth

---

Made strongly saturated solution of $ZnSO_4$ to see if plates would oxidize in this

---

J. B. Conant

Mar 14. /83

Determination of H_2O in $ZnSO_4$

wt crux = 3.330 grs

" " + $ZnSO_4$ = 5.633 "

" + Δ = 5.190 "

5.633	5.190	4.808	2.303
3.330	3.330	3.330	1.478
2.303	1.860	1.478	.825

wt + 2Δ = 4.809

wt + 3Δ = 4.815 N.G.

825000 ⌊2.303
6909 — 35 % H_2O
13410
11515

J. R. C.

Mar 14,

Plate from alum sol

Mar 8 = 82.4780 gms
wt = 82.4645 gms

0,0135 gms

loss = 13.5 mgs in 6 days
from 2 gms alum

013 | 82478

13,000000 | 82478
82478 ,00015
475220
412390
62830 ,015 %

13.5000000 | 82478
8247811 ,000163
525220
494868 or 0.0163 %
303520
247434 J. P. Conant

Mar 15 /82

covered clamps & mus of inside part with collodion and carbonized in linseed oil (c.V.G.)

---

carbonized coating of tragacanth prepared on the 13th as above

---

covered clamp &c with thin leaf tragacanth, the leaf being moistened and wound on

---

considerable quantity of gum is required as it contracts very much on drying and heating.

(over)

Mar 15 /80

wt of Plate = 77,9835 gms
" " NH_4Cl = 0,500 "
300 c.c. sol

wt of Plate = 77,672. gms
" " Na_2SO_4 = 0,500 "
300 c.c. sol

Plated aluminum on carbon from Al sulph

J. P. [illegible]

.7625 : 1 :: 6.4564 : x

6.4564 oz. | .7625
6 100.0 | 8.45 +
35600
30500
51000

Mar 16 / 83

Plate from alarm rod of Mar 3.

wt. Mar 3 = 92.419 grs.
" " 15 = 92.405

.014 grs

.1014 | 13
13 | .0078
.0076 | 6
99 | .0456
91 .004456

loss in 6 days = 6.5 mgs | alarm
" " " " = 13.5 " | .7625 grs
| 2.00 "

2 | 13.5
6.75

.7625 : 1 :: 6.75 : x

6.75 oz | .7625

J. P. Conant

Mar 17 /80

Photos for Meter prepared as follows.

unamalgamated but and unwashed in KOH but scraped bright (turned jet black in 15 minutes)

amalgamated without acid being washed in KOH and then in H_2O (poor result)

amalgamated by sol of sulphate-nitrate & chloride of Hg (washed in KOH + H_2O) (poor result)

amalgated with acid but washed with H_2O between dips and also after amal. (cleaned + KOH (medium)

Mar 17 / 13 continued

amalgamated + acid and washed after amalgamation. (poor)

amalgamated with acid and not washed at all (poor)

Tried to carbonize tragacanth in $ZnCl_2$ but the carbon and gum were simply eaten.

J. P. Conant

Mar 19 /13.

wt of Plate = 14.634 gms +

Na_2SO_4 = 0.500 "

stan. soln - 300 c.c

---

wt of Plate = 13.649 gms 0

Na_2SO_4 = 1.000

stan. soln 300 c.c

---

wt of Plate from Mar 8

wt (14) 12.4645 gms

wt (19) = 12.434

0.0305 loss in 5 days

.0135 " " 6 days

.0440 " " 11 "

Loss = 4 Mgs in 11 days

(over)

Mar 19 / 83.

wt of Plate = 45.3375 gms
NH_4Cl = 1.000
Alum. Sol. = 300 c.c

Plate from acetic Mar 3,
Mar 3 = 45.6655 gms
" 19 = 45.3790 "
.2865

Loss = 286.5 Mgs in 16 days

286.5,00 | 16
16 | 17.90 mgs per day
126
112
145
144
10

1590
1440
96.7

(over)

Mar 19 /87.

wt of Plate = 84.375 grs

NaCl = 1.000 "

Alum sol = 300 c.c.

---

wt of Plate = 85.6315 grs 2

NaCl = 0.500 "

Alum sol - 300 c.c

The action of the alum sol. seems more energetic when only a small quantity of alum is used, at first; but the stronger solution seems to have its action intensified by time

---

(over)

Mar 19/83

wt of Plate = 80.744 grs
citrate Caffein - 0.200
stan. sol. 300 c.c

Narcotin gave ppt.

Nitrate Strychnine = 0.200 grs
wt of Plate = 86.7435
stan sol 300 c.c

Veratrin gave ppt.

Weight of Plate = 78.004 grs
Stan sol. - 300 c.c

To see if the solution attacks the plate

Prepared salycilicate of ammonia to try in meter

J. P. Conant.

Mar 20 /13

wt of Plate = 42.077 gms
citrate caffeine = 0.005 "
stain sol. = 200 c.c.

J. P. Conant

Mar 21 /13

Prepared sulfocyanate of Potassium for use in Meter but it was of no use as it pptd. Zn.

J. B. Conant

Mar 22 /83

Tried to plate aluminium on brass using solution of sulphate of al and alum. result was only partially good

---

Same in alkaline sol and also alum alone gave no result.

Prepared a solution as follows

al sulph - 20 gms

alum - 10 gms

Water - 500 c.c.

J. P. Conant

Mar 23 /80

Wt of Plati = 45.153 grs

Piperine — trace

sol 300 c.c

Made experiment on plating al on Cu

(not very good result)

J. B. Conant

1,135 5000 | 1.3925
11140 0
.815
21500
13925
75750
69625

~~1,1355000 | 1.3925~~
~~111400~~
~~.814~~
~~19500~~
~~13925~~
~~55750~~
~~55700~~

~~.82~~

.82

Mar 24 / 83

Ergotin (alcoholic sol)
ppts Zn and is N.G. for the matter

spg of alcohol.

wt in air F 11.6425
" " H_2O = 10.250
" " Et H_2O = 10.499

11.6425
10.250
1.3925 wt H_2O

11.6425
10.499
1.1535 wt Et H_2O

Mar 24 /80 (continued)

Plate from NH_4Cl of Mar 19 has lost nothing in weight.

J. B. Conant

Mar 26 /83

Wt of $HgCl_2$ = 1 gms.

" of amal lead plate = 64.1855 gms

~~Di~~ Distilled H_2O = 300 c. c.

The object of the above experiment is to determine whether or no a plate of lead amalgamated will either reduce mercury from or be oxidized by a solution of a salt of mercury. the aim being to obtain some metal which may be amalgamated, but which shall

(over)

Mar 124/83

be unacted on by a solution of mercury or a salt of mercury, and also be unacted on by the acid radical set free by the decomposition of such salt - The plate in question to be used as a carrier of mercury in a meter in which the quantity of current shall be measured by the quantity of mercury removed from the one electrode or deposited on the other.

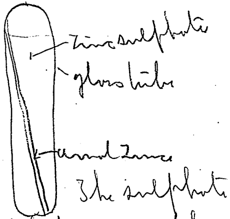
J. P. Conant

J. F. Ott

The hot solution caused the mercury to crack up destroying the smooth surface.

Mar 26, /83

Prepared the following experiment



The sulphate and plate were placed in the tube. the solution was then boiled and the tube sealed the object being to see if the plate would oxidize under these circumstances.

J. P. Conant

April - 19 - 83.

Plate from Na_2SO_4 sol of Mar 15.

wt Mar 15 = 77.8725

" Apr 19 = 77.942

gain .070

---

wt of Plate + from Na_2SO_4

of Mar 19 = 84.634

wt Apr " = 84.710

gain .076

Plate O from Na_2SO_4 of

Mar 19 — 83.649

Apr 19 — 83.714

gain .065

J. B. Conant

April 20 - 1883.

Plate in NaCl + of Mar 19

wt Mar 19 = 84.875

" apr 20 = 84.420

gain = .045

Plate NaCl 2 Mar 19

wt (19) = 85.6315

" apr 20 = 85.6820

gain .0505

Plate from citrate caffein

of Mar 19 = 80.744

wt apr 20 = 80.790

Gain .046

Apr 20 - 1880

Plate from strychnine Nitrate
of Mar 19 = 86.7435
at Apr 20 = 86.8855
gain .1420

Plate from stan sol of
Mar 19 = 78.004
Apr 20 = 78.073
gain .069

Plate from Citrate caffeine
of Mar 20 = 82.077
at Apr 20 = 82.136
gain .059

Apr 20 1883

Photo from Reference of

Mar 23 = 85.153

Apr 20 = 85.204

gain .051

Amalgamated Lead

Mar 24 wt = 64.1655

Apr 20 " = 64.165

loss .0005

cont.

Resumé of Metr Experiment

Boiling the solution and covering with oil does not help matters in the least as in all cases tried there seems to be a reaction between the oil and the solution, the result of which is a deposit upon the plate.

This has been tried with the following oils.

olive oil	White thyme oil
Castor "	Tansy "
Cubeb "	Turpentine
Lemongrass "	Solution also
Wormseed "	covered with collodion which
Origanum "	dried and cracked

The placing in the bottle of other metals with a view to throwing the oxidation on to them, resulted in failure, for the metal was either unacted upon or else taken up by the solution and reduced on the plate.

Acetic – tartaric – citric and phosphoric acids keep the plate bright but act upon it too strongly when present in sufficient quantity to be of service

Chromic acid is reduced by the Zinc

---

of all the other substances tried the only ones that promise ~~best~~ at all are ~~$(NH_4)_2$~~ SO_4 NH_4Cl $NaCl$ – Na_2SO_4 – Citrate of caffeine – Pepsin, which seem to keep down the oxidation some what with out attacking the plate.

It was hoped that among those substances ~~which~~ which kept the plate bright, some might be found whose action would be constant but thus far all seem to be uncertain, the action being strengthened

The experiment of using different methods of amalgamation showed no particular result;

The best result so far a keeping the plate bright goes, is that obtained by boiling the solution containing the plate and sealing the vessel at once.

The plate of amalgamated [illegible] in $HgCl_2$ lost but a small fraction of its weight but as it seems to be covered with

reduced mercury it would appear that the reduction has taken place at the expense of the lead plate. although ordinary tests do not show the presence of Lead in the solution.

Thomas P. Conant,

June 9 - 1883.

Experiment on the weighing of zinc meter plates, the object being to devise a balance whose action shall be extremely rapid and which shall at the same time weigh within a few say 5 to 10 mgs. of the correct weight

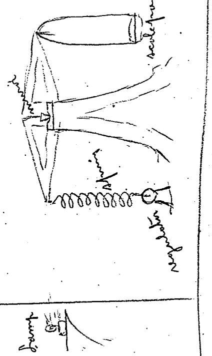
On Monday June 4 - 83 and through the week the following experiments have been performed:

The first idea was to use instead of weights, the tension of a spring and to read the deflection of the scale beam by means of a reflected spot of light

June 9 - cont.

upon a scale placed at any convenient distance.

The apparatus was put together as per sketch below.



June 9 cont.

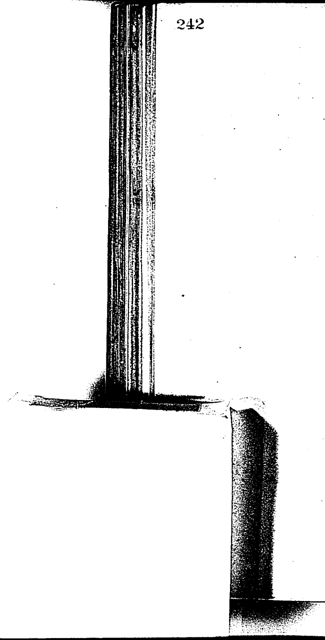
The following springs of brass were tried.

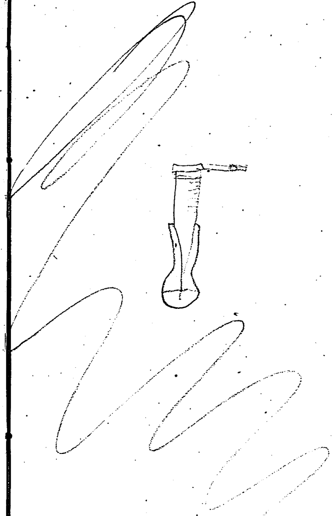
No 1 =
Diam of wire = .030"
" " spring = 3/4"
Length " " = 2"

No 2 = same as above with
length = 2 1/2"

No 3 = ~~.054~~"
Diam of wire = .054"
" " spring = 15/16"
Length " " = 5"

No 4 - same as 3 with
length = 6 1/2"





June 9 - cont'd.

N = 5

Diam of wire = .030"
" " spring = 2½"
Length " = 6"

The trouble with all of these is that if a spring is sensitive enough to indicate a small weight say 10 mgs. a weight of 40 gms or a 25 light plate, will pull it nearly straight while on the other hand if the spring will sustain a heavy weight, the light weight will not affect it.

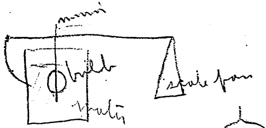
The size of the spring seemed to make very slight different and the only

may to magnify the deflection would appear to be by increasing the distance from the scale to the mirror.

After this passes say three feet, it is difficult from the weighing chair, to see the scale.

With regard to weighing by the hydrometer, the same trouble occurs, that if the ~~[illegible]~~ hydrometer will show the effect of a light weight, a heavy one will push it out of sight.

The apparatus would have been as follows.



showing mode of connecting bulb to lever.

The reason for getting under the bulb is that it is hard to guide it in any other way without an excessive amount of friction.

The idea would be to have the bulb closely balance the

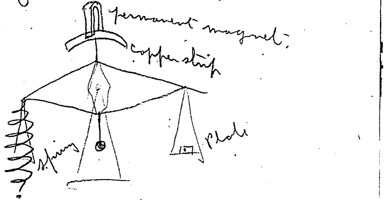
average weight of the plate and then ~~add~~ read from the scale by reflected light, the excess of deficiency with reference to the standard

~~The difficulty with~~ this, by calculation may be proved to be that already mentioned as it would not be easy to ~~so the calculate the average weight as to avoid~~ obtain a set of plates which after use would not show wide differences

Thomas P. Conant,

June 12 - 93.

Experiment to reduce oscillations of balance beam.



The magnet used was strong enough to lift a half pound piece of iron.

The effect was nothing, and the balance shook as badly as ever

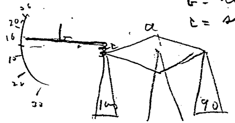
J. N. L.

Began the construction of a balance on following principle. The weight to be suspended by a spring and the lever raised by hand there being an arrangement by which as soon as the scale pan leaves its support, the movement of the lever is arrested by an electro magnet.

June 14 - 83 —

Having noted the difficulty of using a spring between such wide limits as from 10 mgs to say 100 gms = 1 to 10000, it was determined to try the idea of throwing only a portion of the weight upon the spring. In other words, to roughly balance the plate by weights and obtain the fine reading by the spring.

a = beam
b = lever
c = spring



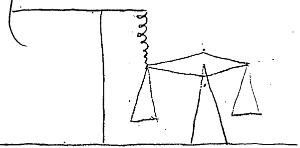
Thus in the preceding sketch, only the difference in weight will come upon the spring.

The experiment was tried and 10 mgs gave a readable deflection, the plate being balanced by weights to within 1 or 2 gms.

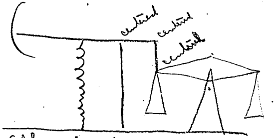
The experiment was repeated, using instead of a spring, a rigid connection between the beam and lever and if the plate be balanced to within 1 gm, the deflection indicate correctly the difference

June 14 - 93 - cont

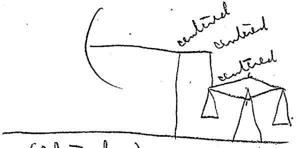
The following sketches show the various methods in which the experiment was arranged



unsteady



(Steady)



(Steady)

a counterpoise was added to the ~~bracket~~ lever to balance the bridge between it and the beam.

Thomas P. Conant.

June 21 - 93,

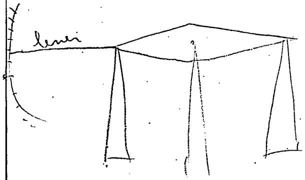
Tried spring of German silver & copper.

The German silver worked well but was not sensitive to small weights while the copper made a poor spring

---

a spring of german silver wire 3" long and having a diameter of 3/4" gave with 20 gms a deflection of 7" but would show nothing short of 100 mgs,

Tried the following arrangement-



In this we do away with all unnecessary friction, and the lever shows from 1 gm to 10 mgs.. (lever 13" long) Lever of course being counterpoised,

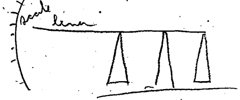
Thomas P. Conant

June 22 80/

Tried electro magnet to damp oscillations of scale beam, using a strip of copper as before, but could notice no effect.

Thomas P. Conant

June 23 /43



Experiment repeated with above balance.

Length of lever from fulcrum = 17"

on the scale 1 gm gives a deflection of 5" - from which 10 mgs should give $\frac{1}{20}$"

By test 10 mgs does just this and hence the balance is sensitive even to 5 mgs

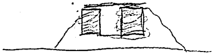
This is true up to a load of 40 to 50 gms but for 80-100

June 20/'05 cont.

gives the deflection for a
given difference is ~~quite~~ smaller

When loaded with
4 25 light plates in each
pan, 1 gm. gives a deflection
of $2\frac{2}{4}$"

J. P. Conant



wt.	air	11.6586
"	H_2O	10,250
"	EH.O.	10503-

$10 ZnSO_4 + 10 H_2O$ | sol a

$10 H_2O$ + current $= 20 \bar{H} + 10 \overset{+}{O}$

$10 ZnSO_4 + 20 H = 10 \bar{Zn} + 10 H_2SO_4$

$10 \overset{+}{Zn} + 10 O = 10 ZnO$

$10 ZnO + 10 H_2SO_4 = 10 ZnSO_4 + 10 H_2O$

$10 ZnSO_4 + 15 H_2O$ | sol b

$15 H_2O$ + current $= 30 \bar{H} + 15 \overset{+}{O}$

$10 ZnSO_4 + 30 H = 10 Zn + 10 H_2SO_4 + 10 H$

$15 \overset{+}{Zn} + 15 O = 15 ZnO$

$15 ZnO + 10 H_2SO_4 = 10 ZnSO_4 + 10 H_2O + 5 \overset{+}{Zn}O$

$5 \overset{+}{Zn}O + 10 H = 5 \overset{+}{Zn} + 5 H_2O$

$15 ZnSO_4 + 10 H_2O$ | sol c

$10 H_2O + C = 20 H + 10 \overset{+}{O}$

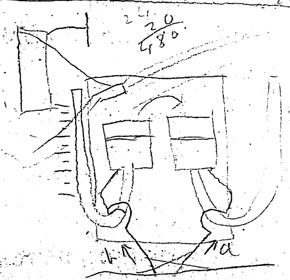
$15 ZnSO_4 + 20 H = 10 Zn + 10 H_2SO_4 + 5 ZnSO_4$

$10 \overset{+}{O} + 10 Zn = 10 ZnO$

$10 ZnO + 10 H_2SO_4 = 10 ZnSO_4 + 10 H_2O$

with xs of H_2O more oxide is formed on positive plate than can be taken up by H_2SO_4 formed

with xs of $ZnSO_4$ the action seems to be all right



Menlo Park Notebook #145 [N-82-12-04]

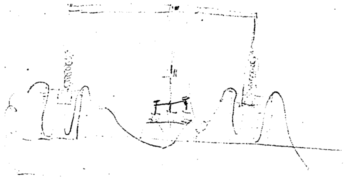
This notebook covers the period December 1882-April 1884. The entries are by Edison, John Ott, Martin Force, Edward G. Acheson, George Gibbs, E. D. Kellogg, and H. de C. Hamilton. Many of the entries relate to carbon filament experiments and include notes and drawings of compound carbon filament lamps; carbons made from parchmentized paper, animal wastes, and foodstuffs such as flour, molasses, and gelatin; and chemical treating of filaments. There are also extensive notes and drawings of meter experiments, including meters using chemical paper. In addition, there are a few notes and drawings relating to safety catches, electro-vacuo experiments to produce gold foil for use in lamps, experiments on the absorption of materials, and battery experiments. The label on the front cover is marked "17th St & Ave B New York." The book contains 284 numbered pages.

Blank pages not filmed: 20-25, 120-121, 176-283.

1

Dec. 4th & 5th /82. George Gibbs.

Experiments with Current Meters.



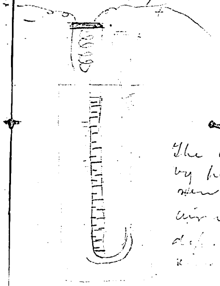
Tried exp with German silver spirals arranged as shown. The spirals were placed under ~~ex~~ inverted glass vessels which were sealed in water as shown. The current which passed through the coil heated it & [illegible] the enclosed air, and raised the glass. This raised one end of beam, tipped the beam, and by means of [illegible] [mercury?] [illegible] then cut off current from [illegible]

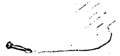
Dec 4 85 — G.G.

first spiral and sent it — through screws.

The external surface of these glasses were also blackened to facilitate radiation of heat.

Solution Citrate Iron & Ammonia: — No success —



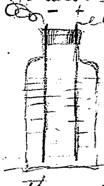


The coil was heated
by passage of cur-
rent — This expanding
air in bulb and
[illegible]
[illegible]

Dec. 21st/82. George [illegible].

Experiments with Secondary Batteries. —

Made up a lot of small batteries of uniform size in following manner: — Took two strips of lead gauge, 1/4 inch wide & 3 inches long; coated both with layer of red-lead, and sewed each up in woolen bag.



Placed them in small vial, as shown. Different solutions were introduced, and the batteries charged for same length of time. They were then discharged through a sounder, thus giving comparative tests. — The following were tried with small [illegible] quires.

Time of charging: — one hour.

Electrodes coated with red-lead

Solution, caustic soda — no current. —

Solution acetic acid — no current

(over)

Solution, – Phosphoric Acid – No current, –
Solution, – Hydrochloric Acid No Current. –
Solution Nitrate Lead – no current, –
Solution (Na Cl) common Salt, no good. –
Solution Sulphuric Acid; – Strong current, but runs down rapidly, and entirely ceases in 80 seconds. –
Solution Chromic Acid – – Momentary current. N.G. —
Solution Chromic Acid with Chromate of Lead on electrodes – no good) – runs down very quickly, —

Dec. 22nd / 82. Geo. Gibbs.
Secondary Batteries. Cont.

Electrodes with red-lead:—
Solution Oxalic Acid —
No current.

Solution Arsenic Acid —
Little Good results — runs down in about one minute. —
Solution Acetic Acid. — Electrodes lead coated with Acetate of Mercury. — No current.

Jan 3rd —
Tried weak solution of KI, with two copper plates — n.g.

Jan 3rd/83. G. Gibbs. —

Electro-Deposition of Carbon in platinum. —

Tried solution containing napthalin and hydriodic acid with little free Iodine. This had to be mixed hot, Did not work; the sol. was a non-conductor of the current. —

Tried also, for same purpose, a sol. of bisulphide of Carbon, — did not work — a non-conductor. —

Jan 6th Geo. Gibbs. —

Experiments with absorption materials &c, to absorb oxygen from bulb & leave pure Nitrogen: —

Tried tube filled with blotting paper pellets saturated with a mixture of pyrogallic acid and caustic potash — (pyrogallate of potash). The exp was not a success, because air was absorbed along with the oxygen, thus giving too high reading (for amount of oxygen absorbed) in fact destroying the accuracy of the registering device.

Tried also suboxide of lead, obtained by igniting cautiously oxalate of lead. The suboxide was moistened with water

(over)

Jan 9th

g. g.

when it rapidly absorbed
oxygen (theoretically) but
also air. this exp. failed
from the reason given
in last exp.

j.b.0 February 3 1883.

Twisted Catenmen fibre Lamp or rather Compound filament Lamp -

about 30 made & Exhausted so far, those having greatest number fibres best in fact 8 fibre filaments stand while the clamps melt from arcing - filament OK = Ends Copper plated & put in pCatenmen Clamp, The resistance is such that one gives 10 candle which a 95 volt Lamp only

Came to yellow most
of them stand
with 185 volts,

Edison
M N Force.
J.F.O

Feby 3 1883

We find that the principle of
making a filament for the
Lamp Compound viz that
Every separate fibre is
separately expansible, is
Correct and that this kind
of a filament can be made
Even & cheap

Feby 3rd 1883 J.F.O

The fibres (Manila) are twisted by a machine then the fibre doubled & allowed to twist on itself - hence it does not open ~~un~~ Carbonizing - The Carbons of this kind Carbzd at lamp factory came out remarkably even - owing to small mass & the high incandescence which these ~~[illegible]~~ filaments of Carbon are intended to be worked at Causing the [illegible] [illegible] of the filament

Feby 3 1883 TAE J.F.O

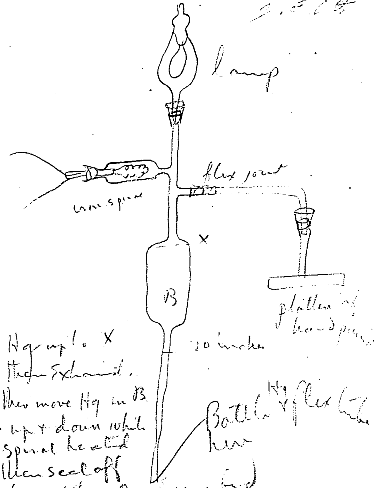
now the only remaining difficulty I have made a great number of Experiments on Low Vacuum in Connection with the Compound filament to the lamp to 27 inches & then seal off & absorb Oxygen by heating iron spiral wire coated with finely divided Iron the oxygen oxidizing the finely divided

Feby 3 1883 TAE J.F.O.

ism, but we have not
succeeded in getting
rid of all the Oxygen
We are now Completing
a device for aspirating
by moving the [illegible]
the Lamp + Spectrum
Wire tube so as to
obtain a Circulation
& pump all the air
to have access to
the iron wire.

over

Feby 3 1883



Hg up to X
then Exhaust.
then move Hg in B
up & down while
spiral heated
then seal off
Lamp when O is reached

July 2. 1883
M. N. Force
~~J. F. Ott~~

Experiment tried with chemical paper with the spark of an induction coil, for ampier meter to be used at central station

Iodid Potass wet Good mark but fades

Red Oxide Mercury wet Fair

Salt and Nitrate Silver & Fixed Good dry

Nitrate Silver moist & Fixed Good

Salt & Nitrate Silver wet No Good

Iodide Potass dry No good

Salt & Silver Nitrate moist Fair
(Fixed)

Tanic acid wet Poor Mark

Acetate Uranium dry Nothing
+ Potass wet Nothing

Gum Dextrin dry "
dry "
wet "

J. F. Ott July 2 1883 M. M. Fr

Amygdaline – wet Nothing
E Bruhn dry ,,

Gallate Amonia wet Poor

Acetate Strontia dry Nothing
wet Good
dry Nothing

Acetate of Nickle wet Good
dry ~~Nothing~~ Holes

Chloride Alumina wet Nothing
dry ,,

Citrate Magnesia wet ,,
dry ,,

Gum Guacum & Caustic Pot wet Good
dry No

Carmine wet Poor
dry No

Lacto Phosphate Bismuth wet No
dry ,,

Arsenate Soda wet ,,
dry ,,

Pyro Phosphate Natrium wet ,,
dry ,,

Benzoate Ammonia wet Fair
dry No

E D Kellogg J. Ott July 3 M.H.P.

1 Tart Acid J. wet Nothing
dry "

Salt & Silver Nitrate dried two days
fixed with salt — — Good.

Acetic Solution $KClO_3$ + $Na\,Cl_2$ + $Co\,Cl_2$
wet Nothing dry burns holes

~~"~~ Alum Acetic wet Nothing
dry "

Red Oxide of Pb wet "
dry large holes

" " $Co.Cl_2$ wet No
dry "

" " Sulphate Lead wet "
dry "

" " $Pb\,SO_4$ wet "
dry "

" " Chloride Cobalt Salt wet "
dry "

" " $Co\,Cl_2 \times KClO_3$ wet "
dry "

" " K_3 + $Na\,Cl$ + Pyrogallic Acid wet Poor
dry L. holes

" " $Na\,Cl$ wet No
Poor holes

E D Kellogg J. F. Ott July 3 1883 M. M. F.

1 Salt + sesquioxide Iron + Pyrogallic Acid wet No dry No KI wet No

---

$PbSO_4$ Burned on paper

KI —— wet Fair
dry L holes

$PbSO_4$ dry No

2 Tartaric Acid wet No
dry L holes

Acetic Solution Sesquioxide of Iron
wet No
dry "

---

1 " " Chloride of Cobalt
wet No
dry "

" " K_3 + $NaCl$ wet Poor
mark fades
dry No

" " Iodide × Chloride Co + $NaCl$
wet Good
but it fades
dry plain
holes

" " Salt Sesquioxide Fe wet No
dry Plain
holes

E D Kellogg July 31 1883
M. A. T.

Acetic Solution Na Cl + K ClO_3 wet Nothing
J. F. Ott dry Plain holes

" " K_3 wet Good mark
dry holes but not plain

" " Chloride Cobolt Iodine wet No
dry Plain holes

" " Chromic Oxide + Salt wet No
dry plain holes

" " Chromic Oxide wet No
dry plain holes

" " Na Br wet No
dry plain holes

" " Na Cl wet No
dry plain holes

" " Chromate of R wet No
dry Plain holes

" " Soda Tartrate wet No
dry plain holes

Mn SO_4 + Alum wet Poor mark
fades dry Nothing

ED Kellogg July 3-1883 M.N.F.

$KClO_3$ J. F. O.H. wet Nothing
dry ,,

Protochloride Iron + Acetic Acid
wet No

Acetic Acid Sol wet No
dry plain holes

Protochoride Iron + Acetic Acid
dry plain holes

$(NH_4)+HS$ wet No

$Cu\,SO_4 + Mn(SO_4)$ wet ~~No~~ Good
dry No

$Hg + C$ wet Poor mark
dry plain holes

$K\,SO_4 + Mn(SO_4)$ wet Fine mark
dry plain holes

Bromide Potash. wet goods with Point in contact with Paper but poor without
dry - Holes

E D Kellogg J ~~F~~ July 2 1883 M. H. F.

Tart. Magnesia wet Nothing
dry Nothing.

Nickel Sulphate wet Nothing
dry Nothing

Sesquioxide Iron wet - Nothing
dry - holes

Nickel Sulph. & Caust. Potash wet Nothing
dry Nothing

Bromide Sodium wet good with point in contact. dry Nothing.

Iodine ReSublimed wet good with point in contact. dry. Holes

Aniline Acetic wet good with point touching paper. dry Nothing

Niccol. Acetic wet ~~fair~~ very good
dry holes

J. F. Otto E. D. Kellogg July 3 1883
M. N. F.

Nitrate Potash	wet	very fine
	dry	very good
Extract Hemlock & NaCl.	wet	very good
	dry	good
Bitartrate Potash	wet	Fair
	dry	Fair.
Bichromate Potash	wet	very good
	dry	very good
Nitrate Sodium	wet	good
	dry	good.
Phosphate Potassa.	wet	good
	dry	Fair
Ammonia Bichromate	wet	good
" "	dry	good.

J. F. Ott E.D. Kellogg July 5 1883 MNF

Sulphuret Potassium	wet	Fair.
	dry	Fair
Microcosmic salts	wet	Nothing
	dry	Nothing
Nicol. Carbonic	wet	~~Nothing~~ Fair
	dry	Good
Iodide of Ammonia	wet	v good
	dry	Good
Double Sulph Copper & Ammon.	wet	Fair
good with point touching Paper		
	dry	Good
Bi-sulphate Soda	wet	Fair
	dry	Good
Carbonate Ammonia	wet	Good
	dry	Good
Manganous Acetate	wet	Good
	dry	Good
Boric Acid —	wet	Nothing
	dry	Good
Acetate Copper	wet	Good
	dry	Good

J. F. Ott E D Kellogg July 3 1883

Sulphate Manganese	wet	good
Holes ~~[illegible]~~ in a line	dry	Good
Bromide Magnesia	wet	Nothing
holes in a straight line	dry	Good ~~[illegible]~~
Prussian Indigo	wet	Nothing
Holes in a line	dry	good
Prussian Indigo + Na Cl	wet	good
	dry	Fair
Stanneous Acetate	wet	Fair
	dry	Fair
Chromate Potassa	wet	good
Holes in a line	dry	good
Citrate Caffein	wet	nothing
	dry	Good threads a little
Citrate Caffein + Na Cl	wet	Fair
	dry	Good threads a little
~~Chloride~~ Oxide Cobalt	wet	Nothing
~~[illegible]~~ Holes in a line	dry	Good
Oxide Cobalt + Na Cl	wet	Fair
	dry	good Holes in line

J. F. Ott E D Kellogg July 5 1883

Chloride Chromium wet good
Holes in line dry Good

Gum Myrrh wet Nothing
dry Good holes in line

Gum Myrrh & Na Cl wet Fair
good with point in contact
dry Good holes in line

Nitrate Cobalt wet good
dry good Holes in a line

Hypophosphate Iron wet Nothing
but good with Point touching paper
dry good holes in a line

J. F. Ott E. D. Kellogg July 6 1883

Sulphate Magnesia	wet	Fair
	dry	good holes in line
Nitrate Barium	wet	Good
	dry	Good Holes in line
Protochloride Tin	wet	Good
	dry	Good holes in line
Yellow Ochre	wet	Nothing
	dry	Fair
[illegible]	wet	Poor (dim) sparks
	dry	very Fair
Oxide Tungstate	wet	Nothing
	dry	Good holes in line
Egg Albumen	wet	Good with Pt. touching
	dry	Good but holes spread a little
Blood Albumen	wet	good with Pt. touch.
	dry	Good but [illegible] spreads a little
Antimonic Acid	wet	Nothing
	dry	Fair
Oxalate Cerium	wet	Nothing
	dry	Fair
Sulphate Copper	wet	Good
	dry	Good holes in line

J. F. Ott July 6 1883 EEMU063

Monochloride [illegible] wet Poor Mark
dry good roles very straight

Chloride Calcium wet ~~Fair~~ good ~~with~~
~~[illegible]~~ dry Good

Acetate Calcium wet good
dry good

Lanthanium & Didymium Acetates wet good
dry Good

Aluminium Sulphate wet good
dry Good

~~Calcium Nitrate wet good~~
~~dry~~

Cadmium Acetate wet good
dry good

Magnesium Acetate wet good
dry Good

Zirconia Acetate wet good
dry Good

Zinc Acetate wet good
dry Good

EDKilley. J. F. Ott July 6 1883

Manganous Nitrate Good M. N. F.
dry Good

Chloride Zinc wet Good
dry Good

Cerium Acetate Good
dry Good

Acetate Lime wet ~~Good~~
dry Good

EDKilley July 7 1883

Aluminum Nitrate wet Good
dry Good

Sugar Alcohol wet Fair
dry Poor

Nitrate Ammonia wet Good
dry Poor

Barium Chloride wet Good
dry Fair

Stannate Soda wet Good
dry Fair

Calcium Acetate wet Good
dry Fair

Magnesia Nitrate wet ~~dry~~ Good
dry Good

J. F. Ott E D Kellogg July 7 1883 M. N. F.

Cadmium Nitrate wet Good
dry Good.

Titanium Acetate wet Good
dry Good

Titanium Chloride wet Good
dry Good

Stannous Nitrate wet Good
dry Good

Aluminium Chloride wet Good
dry ~~very Fair~~ Fair

Aluminium Acetate wet Good
dry Good

Strontium Chloride wet Good
dry very Fair

E D Kellogg J. F. Ott July 9 1883 (M-M-F)

Uranine wet Good
dry Good

Zinc Sulphate wet Poor
dry Good

Silver Cyanide wet Fair
dry Fair
dissolved in Ammonia

Saffron + Salt wet Very Poor
dry Fair

Acetic Sol. Cobalt Chloride wet Good
dry Fair

Acetic Sol Cobalt Chloride & NaCl wet Good, Finer mark than preceding
dry Good

Acetic Sol Cobalt Chloride + Chlorate Potash ~~wet~~ Good but wide Marks
dry Fair Holes far apart and di

Acetic Sol. Chloride Cobalt + Chlorate Potash + NaCl wt Good – Fine Marks –
dry Good Edges of Holes turn green but green fades away

Chlorate Potash wet Good mark ~~not wider than some~~
dry Poor – small holes –

J. F. Ott E D Kellogg July 9 1883 M. M. F

Chlorate Potash + Salt wet gives good fine mark but not very black
dry Good but not very black holes

Sal Ammoniac wet Good mark
point must very close
dry Poor dim holes

Permanganate Potash Fine mark
color fades ~~but~~ dry not dim mark any
dry Poor

Permanganate Pot. + Na Cl wet Fine Mark
color fades little but does not dim the mark
dry Nothing

Sodium Tungstate wet Poor - good
with Point touching Paper
dry Poor dim Holes

E D Kellogg July 16 1883 M. N. T.

Tried Cadmium Sulphate wet J. F. Ott
Fine mark very black dry very Fair

Cadmium Sulphate + Na Cl wet gives
Good mark but not as black as
preceding dry it gives a good
black holes but not in a very straight
line.

Cadmium Bromide wet gives a dim mark
dry Tair mark

Cadmium Bromide + NaCl wet gives
Plain mark but not fine. dry Good
black holes but not in straight line

Cadmium Chloride wet gives no mark
at all. dry Holes in a good straight
line but not very black

Cadmium Chloride + NaCl wet gives
no mark except when Point touches
paper. dry the mark is about same
as in preceding

Acetate Barium wet gives good
plain mark but not regular
Dry gives very plain holes
but not in an a perfectly straight
line

J. F. Ott July 10 1883
E D Kellogg M. N. F

Acetate Barium & Na Cl wet gives very plain & fine marks but not as black, or irregular as in preceding
Dry gives Holes but not as plain nor as straight as in preceding.

Nitrate Lead. wet gives good fine marks but in some places darker than others.
Dry very black holes but not in straight line enough

Nitrate Lead + Salt gives about same result wet but dry the holes are in a straighter line.

Cadmium Oxide wet gives no mark at all dry shows blackened holes but not straight line.

Cadmium Oxide + Salt wet gives very ~~f~~ plain marks but wide
Dry about same as preceding

Acetate Alumina wet gives nothing at all but dry it gives black holes in a crooked line

Acetate Alumina + Salt gives a very good mark when wet.
Dry about same as preceding

EDKellogg July 10 1883 J. F. Ott
M. N. Force

Cadmic Sulphide wet gave Plain mark but not fine or even
Dry blackened Holes in ~~fa~~ very fair line

Cadmic Sulphide + Salt wet. gave very dark line but broad
Dry blackened holes but not as straight line as the other.

Zinc Oxide wt gives plain mark but very uneven dry it gives very good mark.

Zinc Oxide & Salt wet good mark. but rough dry good Mark

Precip Carbonate Zinc wet gives good mark but irregular
Dry Good marks

Precip Carbonate Zinc + NaCl gives very plain mark
Dry Good plain holes and in very fair line

E D Kellogg July 10 [illegible] J. F. Ott

Iodide Cadmium wet gives fine mark dry also good mark

Iodide Cadmium + NaCl wet gives good mark also good mark dry

Citric Ammonia wet Good mark but Irregular Dry very good mark

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Citric Ammonia + NaCl Good marks both wet & dry

J. F. Ott · July 11-1883
M. N. T.

Oxalate Lead wet gives no mark at all Dry it shows very good mark. Large black holes

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Oxalate Lead + Salt wet. fine mark but not very plain.
Dry good mark. medium size holes

Carbonic Cadmium ~~wet~~ gives nothing till it partially dries off then ~~current~~ burns holes
Dry very good holes - large, black & in a line.

Cadmium Carbonic + Salt wet fine mark and quite plain ~~dry~~
Dry. very good mark large black holes in a good line.

Sulphate Calcium gives no mark till nearly dry then begins to make holes and when perfectly dry makes very good black holes

---

Sulphate Calcium & Na Cl. wet gives very good plain & fine mark
Dry Good large holes and black

EDKellogg J.F.O.tt July 11 1883 M.N.T.

Sub Carbonate Bismuth wet gives ~~nothing~~ ~~no~~ Poor mark but as it dries off gives larger + larger holes till dry when it gives large black holes and in very straight line

Sub Carbonate Bismuth + NaCl wet gives very good fine mark but irregular
Dry large black holes in very Fair line

Carbonate Lead gives poor mark till nearly dry then very fair
Dry very large holes and in very good line.

Carbonate Lead + NaCl wet Nothing
Dry very good mark Holes large + Black

Caustic ~~Bismuth~~ Barium wet very plain mark but very broad
Dry large black holes in very good line

Caustic Barium & NaCl wet very fine mark + very plain
Dry medium holes + Black

ED Kellogg July 2 F. Ott

Oxalate Ammonium wet. Fine mark but broad + irregular
Dry very fine large ~~b~~black holes and very straight line

Oxalate Ammonium + Na Cl wet
No ~~mark~~ mark except when point touches paper then very good
Dry very fine mark holes larger blacker + in a straighter line than the one preceding which is very fine

Hyposulphide Soda wet very fine mark but ~~very~~ irregular dry it makes large black holes in very fair line

HypoSulphide Soda + Salt wet
Good fine line but not unless it is very wet.
Dry very good. large black holes + very good line

J. F. Ott July 12 1883
E D Kellogg M. U. H.

Phosphate Ammonium wet gives very plain mark but very broad
Dry very large black holes in good line

Ditto + NaCl wet gives very good mark but uneven.
Dry medium holes, black + in good line

Oxalic Acid wet Fair mark. (wide + dim) Dry very good mark large black holes + very good line

---

Ditto + NaCl wet fine mark but not plain
Dry large holes in good line

Arcenate Copper wet. No Mark
Dry medium holes but very plain and in very good line

Ditto + Salt wet gives very fine and quite plain mark but rough
Dry ~~very~~ medium holes and very fair line

J. F. Ott July 12 1883
E D Kellogg W U T
Pyrophosphate Sodium wet
gives dim + broad line also ~~very~~
irregular
Dry Small holes + not very
plain but fair line

Ditto + NaCl wet fine line but
very uneven + dim
Dry medium holes in very fair
line

Caustic Potash wet very plain
but wide + uneven
Dry Medium holes quite plain
and fair line

Caustic Potash + Salt wet very
black mark but uneven
Dry medium holes quite plain
and good line

Red Sulphuret Antimony wet
bluish tint to Paper but not very
plain + very broad
Dry medium holes + very plain
+ black

Ditto + NaCl wet fine white mark
very regular + plain
Dry large black holes in fair line

J. F. Ott July 12 1883
M. N. Kellogg
Arcinate Antimony E wet gives
No result at all but dry it
shows large holes plain but not
very black + fair line

Arcinate Antimony + Na Cl
wet gives fine mark but scarcely
perceptible except when point touches
paper then there appears very good
line
Dry about same as preceding
excepting straighter line

Carbonate Copper wet shows
nothing at all but dry there are
very good holes + very fair line

Ditto + Salt wet very fine
line but very irregular.
Dry large ~~holes~~ black holes + very
fair line

Fluoride Calcium wet Nothing
Dry medium holes dim but no good
line

Ditto + Salt quite plain depression
in paper also irregular fine line
Dry small holes quite black +
very fair line

EDKellogg July 12 1883 J.F.Ott

Arsenious Acid M U F wet 40
mark at all

Dry very small + dim holes
fair line f.

Ditto + Salt wet fine mark
but irregular

Dry very small holes dim
but good line

J. F. Ott July 13

M.W.F. EDKellogg
Oil Carrie & Benzine dry
Poor mark - small dim holes

Oil Cubebs + Benzine ~~dry~~ ~~very~~
Fair mark small but. Plain holes

Fusel Oil + Benzine. dry very
Fair mark. small but Plain holes

Oil Wormseed + Benzine dry
very Fair small but plain holes

Oil Lemongrass + Benzine dry Fair
mark ~~dim~~ small but plain holes

Oil Citronella + Benzine dry Poor
small + very dim holes

Oil Tansy ~~dry~~ + Benzine dry
Poor small thin holes

J. F. Ott July 12 1883
EDKellogg M N F

Tried saturating a piece of over it
cloth with ink cloth fixed on drums and paper and passing
spark through from drum f
to needle calculated to have
sparks bring up with it enough
ink to blacken edges of holes.
did it very well but ink was
apt to run through and spread
over paper

July 16. EDKellogg

Tried coloring linseed oil with
red Lead ~~+~~ saturating cloth in same way but it did not
work at all

J. F. Ott July 18 1883 E. H. Kellogg M. M. F.

Tried red Aniline & water mixed
a cloth fixed in same way as
preceding. It gave very plain
black marks but not due
I think to the aniline but to
the water making good conductor
for sparks but poor for heat
so the paper was burned
Used brown Legal Cap paper

Tried also paper right on
cilinder without anything else
which gave very good marks
both when Legal Cap or thin
note paper was used

Tried also rapping drum
in cloth & putting nothing on
it then paper over it & passing
sparks through which
gave nothing at all
I then soaked ~~paper~~ cloth
in a solution of Caustic Soda
& it gave very fine marks as

E D Kellogg, July 18 1883
good as first one on page 99

J. F. Otto

Aug 27. 1883

Boiled Linseed oil to thick paste then disolved in, Carbon, Bisulphide, Chloroform, Sulphuric Ether, and Benzole covered tissue paper stuck together dried and carbonized

J. F. Ott

Sep 5. 1883

Parchmentized tissue paper then washed dried and pasted together with Gum Tragant with gave very good results

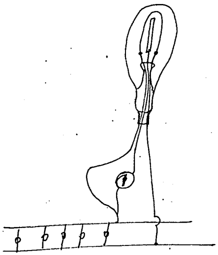
Sep 5, 1883

Parchmentized tissue paper laid on top of each other and left lay for several hours then washed and dried and found it a solid mass

Oct 8. 1883

J. F. Ott

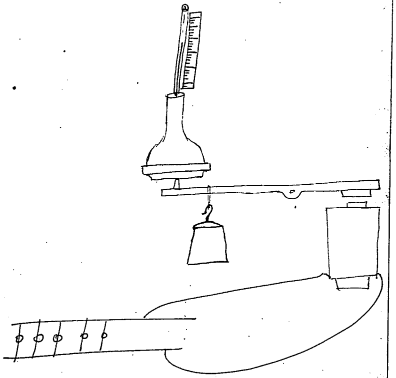
Mr Edison ordered a working model made to indicate pressure ~~across~~ the line, according to sketch given to me dated Oct 8. 1883. Sci. Book No 204 page 67



Oct. 8, 1883

J. F. Ott

Made working model to indicate pressure on line after following manner



Oct 15, 1883

Parchmentized tissue paper pasted together before dryed with Gum Tragant, heated and Air dryed and found they adheared together without slightest flaw in it.

J. F. Ott

Oct 22. 1883

Baught and tested different kinds of paper and found the English the best. it being more even in its structure.

J. F. Ott

Oct. 83.

Parchmentized tissue paper put them on top of each other, then put under preasure and heated, and found them stick together

J. F. Ott

Nov 22. 83.

Parchmentized tissue paper fastened them together with Gum Tragant by subjecting them to preasure and heat when dry pumicedstoned them of smooth making the sheet a perfect even structure

J. F. Ott

Nov 22. 1883.

Made several sheets with 10. and 11. sheets on top of each other uniting them together as one sheet and sent to lamp factory to ~~mark~~ cut up into filiments and put in lamps

J. F. Ott

Nov 23. 83

Disolved Resin in Alchol and imassed parchment strips and fastened together,

Also the unparchmentized strips. by subjecting them to pressure and heat

Also disolved boiled Linseed oil in Eather and fastened sheets together

Also dissolved Resin in Benzine

J. F. Ott

Volts and resistance (3) Three of the lamps mad of parchment paper Carbons at 16 Candles

Volts	Res	Foot lbs	Amp	Lamps per H.P.	Cndls per H.P.
132.5 —	242 —	3206 —	.589 —	10.29 —	165 —
126.5 —	237 —	2989 —	.534 —	11.04 —	177
129.5 —	239.1 —	3079 —	.561 —	10.66 —	171

Size of Carbon 6" $\frac{3 \times 20}{1000}$

Life of each lamp at 64 candle power

No	Min	No	Min	No	Min
		4 —	75	8 —	95
1 —	10	5 —	90		
2 —	20	6 —	90		
3 —	55	7 —	95		

this test made at Lamp factory J. F. Ott

Plated Lead safty catches for street mains by drilling small holes in then plating them with copper making a perfect contact without riviting plates on

J. F. Ott

Dec 7 1883
J. F. Ott M. N. F.

Made a solution of resin and alcohol immersed a piece of bamboo paper in it drying the same in the air after drying pressed it for the purpose of making a carbon filament Sent to lamp factory to be carbonized.

Also made sol. of turpentine and resin for the same purpose pressing it after drying

---

Also one of gum Tragacanth and ammonia pressing after drying

Dec 10 1883
J. F. Ott

Made a boiling solution. alcohol sugar and water: immersed bamboo paper leaving it in for about fifteen minutes to get the solution well through it then took it out and let it dry in the air after drying I then pressed it and sent it to lamp factory to be carbonized

---

Also made sol of gum dextrin and one of starch

Dec 21, 83

Stoped at lamp factory and called for bamboo paper that were carbonized, and discribed on page above

J. F. Ott

Went to slaughter house to get samples of horn Bladder and Intestines Grissel, softened them in Linseed Oil, and pressed them in sheets then cut them as samples to send to Lamp Factory to be Carbonized

Dec .83,

J. F. Ott

Made solution of the following ingredients for the purpose of making Carbon fillments from

Glue and Geletin
" " Charcoal

Glue and Gilatin and Charcoal
" — " Burnt Sugar
" — " Flour —
" — " Dextrine
" — " Resin

J. F. O.H. Dec. 27, 88.
Mixed Gum Dextrine & Flour

Flour Water and lamp black
" — " " Burnt sugar
" — " ————
" — " and sugar sol sat
" — Glue water
" — Olive oil
" — Gum Tragacanth
" — Water Charcoal
" — Plumbago
" — Drop black

Flour – Collodium

Flour and sat sol of Glue

" Kerosene and Resin

" Pearl Sago gummy

" Fish Glue gummy

" Linseed oil

" Glue water sat Sol

All compounds up to present ~~time~~ containing oil make them brittle

Dec. 28, 83,

Also Lamp black, Drop black, Plumbago,

Dec, 28, 83

Flour Cocoa butter

" Milk sugar

New York Jan 4 1884
M. N. Force

Tried the following ingredients with (Starch as a base) for the purpose of making carbon filaments.

Sol. Starch gum tragacanth and glue water, poured out in sheets and left to dry. This was no good.

Sol. Starch tragacanth & gum arabic. poured in sheets. This also was. n.g.

Starch sugar and flour boiled together into a thick paste or dough then rolled into sheets; and filaments punched from them. this worked very well.

New York Jan. 4 1884
M. M. Force

Molasses & flour boiled together into a thick paste then rolled into sheets, and filiments punched from them, this also worked well

---

Starch and gum tragacanth boiled together, flour added after to thicken to a dough then rolled into sheets. and filiments punched from them. this made very fine sheets

Jan. 5 1884
M M Force

Starch and gelatin boiled together and made into a dough and sheets made from this also and filiments punched from it

Starch boiled, gum tragacanth addded then thickened to a dough, with powered starch This was no good as the pwd-Starch made it to short same as when mixed with oils

---

Starch gum tragacanth and flour mixed cold. To a dough. Then rolled into sheets and fila-ments punched from it. This also made very fine sheets and filiments

---

Sol. Starch and sugar poured into sheets left to dry. This was no good

New York Jan 5 1884
M. N. Force

Starch sugar and dextrin boiled to a thick paste rolled into sheets and filiments cut from it. also a paste made of Starch and sugar. both worked very well

Jan 7 1884
M. N. Force

Starch powdered pearl sago and flour mixed to a dough then rolled into sheets and filiments cut from it.

Starch pearl sago flour and sugar made and cut into filiments.

Sol. Mad from both but like all others where no good.

New York Jan 9 1884
M. N. Force

Starch gelatin and a minimum amount of molasses or syrup boiled together and thickened with flour to a dough. then rolled in sheets to .003. in thickness and filament punched from it.

New York Jan 9" 84

Made filaments from the different combinations & sent them to lamp-factory for carbonization.
Edw. H. Hamilton.

Jan. 14" 84.

Starch, pearl-sago & molasses mixed together & poured into sheets; it keeps very plyable. Hamilton

Hamilton Jan. 15" 84

Starch + arrow-root boiled together + poured into sheets; very clear when dry but also very brittle.

ditto - ditto plus tragacanth; same result.

Jan 15: 84

Starch + arrow-root boiled together + thickened to a dough with flour, then rolled out in sheets + filaments punched from it. Hamilton

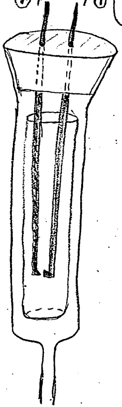
Hamilton. Jan. 17" 84.

Starch + arrow-root boiled together + a small amount of molasses mixed in to keep it from getting brittle; poured out in sheets it kept ply-able for 8 or 10 days.

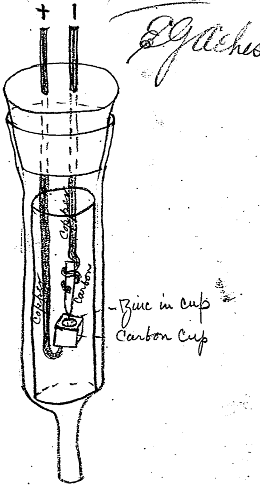
New York Jany 10 188?
M N Force

For producing Gold Foil by Electro—
vacuo deposit—

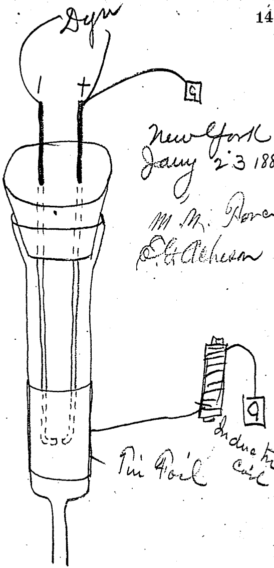
(+) 1 +0 (Copper rods with Gold points)



New York Jany 11 1884



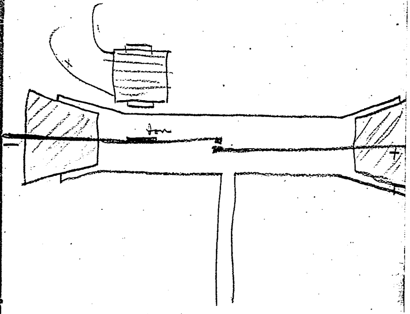
E G Acheson



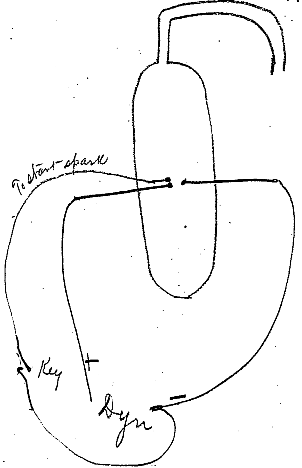
New York
Jany 23 1884
M. M. Rowe
E. G. Acheson

New York Jany 30 188[illegible]

E. G. Acheson
M. N. Force

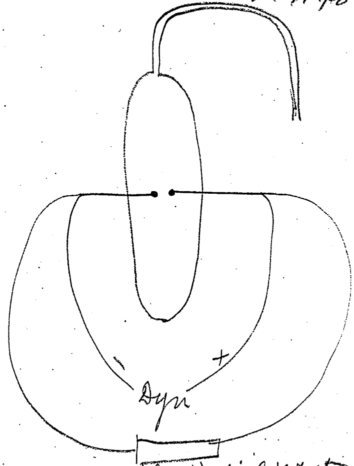


El. Acheson
M. H. Force



New York Jany 31 1884

El a chine
M 11 Force

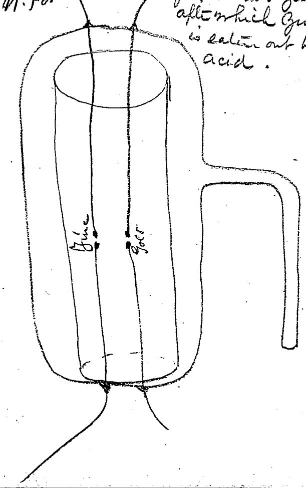


Induction Coil to start spark

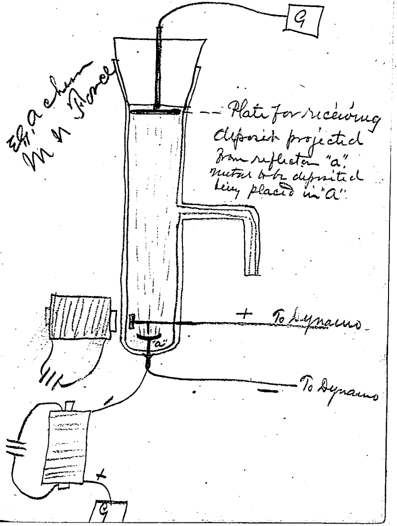
New York Jany 31 1884

For depositing alternate layers of Gold and Zinc after which Zinc is eaten out by acid.

E G Acheson
M N Force



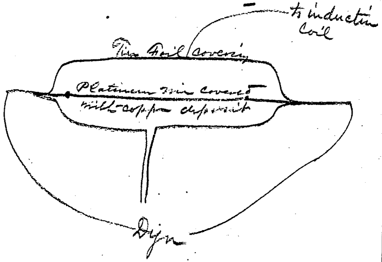
New York Jany 31 1886



Edw. Acheson
M N Force

New York Feb 2 1884

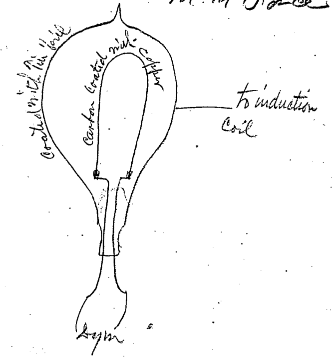
M. A. Force



Ely Acheson

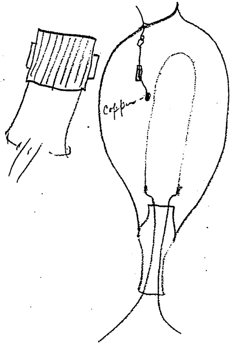
New York Feb 2 1884

E G Acheson
M. M. Force



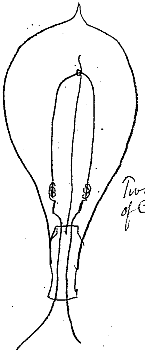
New York Feb 5 1884

E G Acheson
M G Force



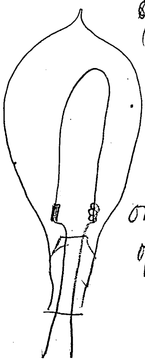
New York Feb 5 1884

E. G. Acheson
M. N. Force



Two loose clamps
of Copper

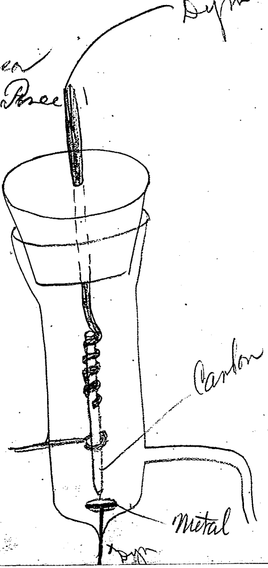
E H Acheson
M N Force



one loose clamp
of Copper

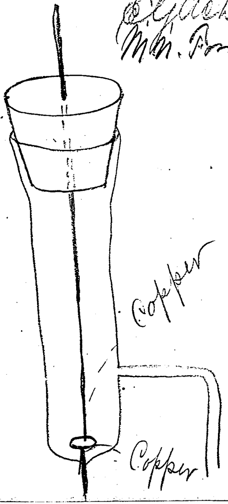
New York Feb 6 1884

E G Acheson
M N Force



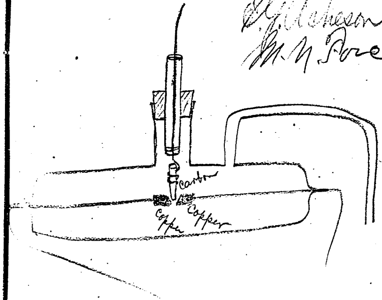
New York Feb 6 1884

E. G. Acheson
M. N. Force



New York Feb 8 1884

E. G. Acheson
M. N. Force



HYGROSCOPE →

New York Apr - 21 11 1884

Martin N. Force

Experiments on combinations of different substances for the purpose of making carbon filaments

Magnesia Oxide & Gelatine
" Chloride " "
" Acetate " "

April 5 1884

Dried film tragacanth are marvelously sensitive to moist finger 3 inches away throws it into violent Contortions apply it to Hygroscope - TAE

M N Force

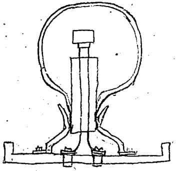
Menlo Park Notebook #146 [N-79-02-20.2]

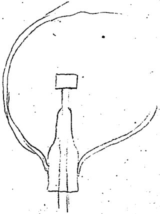
This notebook is undated but was probably used in 1880 or 1881. There are entries by Edison and probably by Charles P. Mott. The material was copied from other notebooks, which were probably used in patent interference cases. A number of entries give references to specific interference cases. Included are notes and drawings of carbon filament lamps, vacuum pumps, and dynamos. In some cases, a date has been assigned to material that was not dated in the original notebook. The book contains 284 numbered pages.

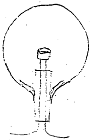
Blank pages not filmed: 18-19, 46-47, 78-79, 110-111, 142-284.

Missing page numbers: 129-130.

Feb'y 20, 1879
TAE

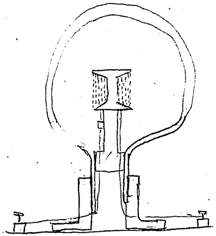


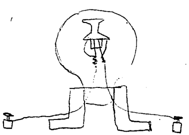




Vol. 20, page 1

Feb. 24, 1879

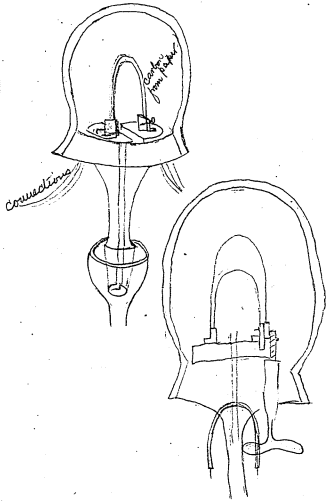




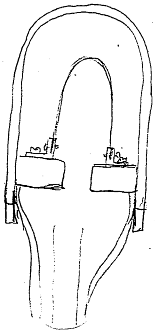
Vol 57 – page 1

Mch 29, 1880

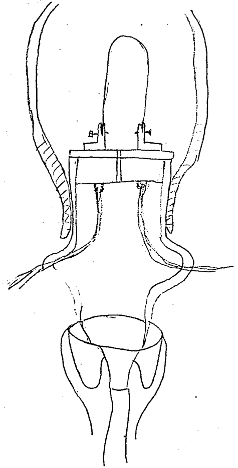
Carbonizing in Vacuo
Chas. Batchelor



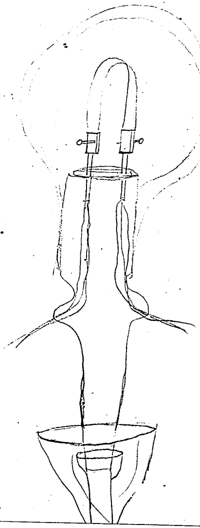
Vol 57, page 4



Vol 51, page 7



Vol 51 page 9



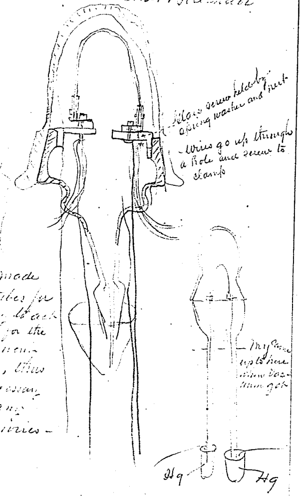
Vol 51 page 11

Carbonizing in Vacuum Mch. 29, 1880

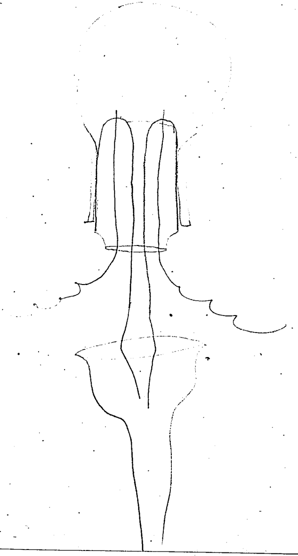
Chas Batchelor

Made by
Batchelor
C Bothm
C. Dean
M. Force

This was made
with two tubes for
the mercury to act
as conductors for the
wire which were
dipped down, thus
it was necessary
to seal in any
platinum wires -

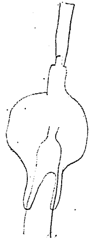


Vol 51 Page 15

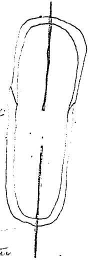


March. 20, 1879.

TAE



Cement joint



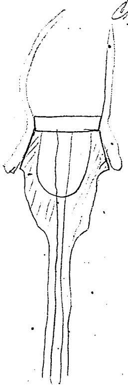
3 $\frac{20}{1000}$

twisted together

Vol 57 Pge 83

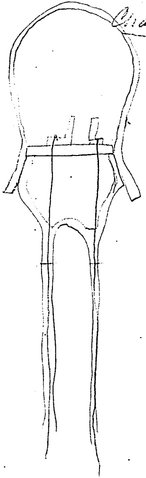
March 30. 1880

Chas Batchelor



Mch 30, 1880

Chas Batchelor

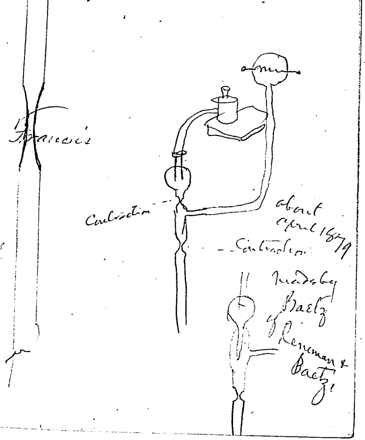


Vol 85 Page 97.
Drawing of a pump dated
Oct 2^d 1879 signed by S. D. Mott
and T. A. Edison

References for Bohms Interference— Contraction integral with mercury fall tube.

Book No. 68. page 27.

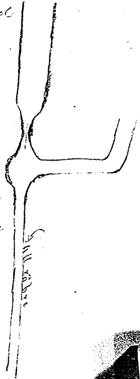
April 15th 1880



April 16th 1880

Airpump devised by Francis and Upton

Repair- made on airpump this part made new in the morning



= repaired

McLeod gauge broken on pumps marked 4.

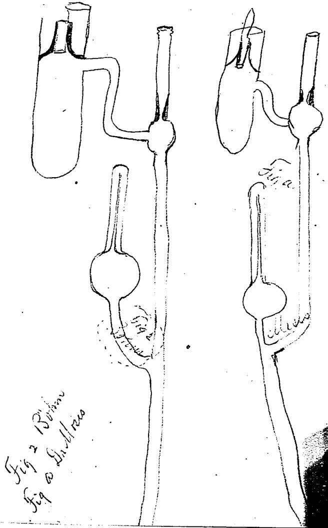
Book 68.

Page 42

Sketch on page 43 shows a device of a Sprengel pump in which McLeod gauge tube and fall tube are one tube. Fig a shows first device. Fig 2 shows second device. Fig a was devised by Dr Moses Modification shown in Fig 2 was devised by Böhm

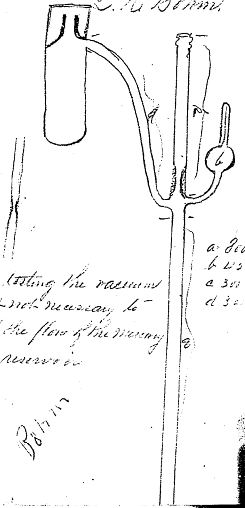
Book No. 68. Page 43

April 20th 1850.



No. 68 page 45.

April 21st 1880
L. K. Bohm.



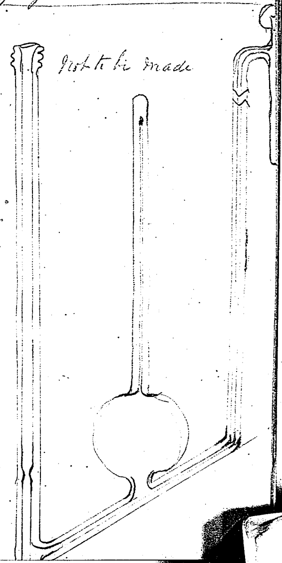
a 800 m m long
b 45 " " in diameter
c 300 " " long
d 3[illegible] " " "

for testing the vacuum
is it not necessary to
stop the flow of the mercury
the reservoir

Bohm

No. 68. page 49.

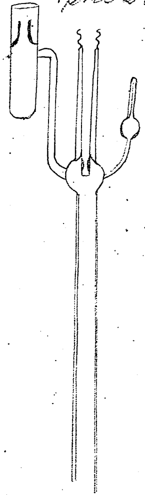
Dr. Moses



No. 68 pge 58

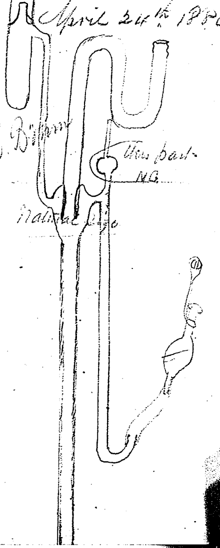
April 23rd 1880

L K Böhm



No. 68 page 57

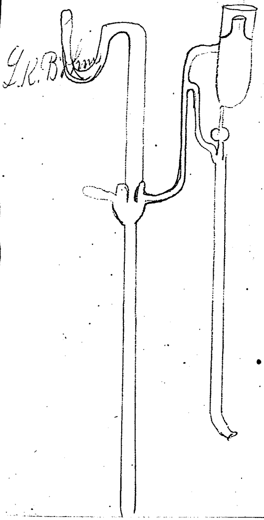
April 24th 1880



G. R. Brown

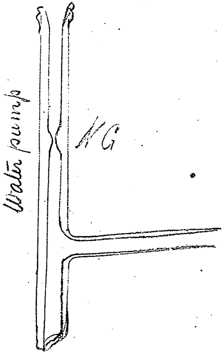
No. 68, page 63

April 26th 1880



No. 68. part of page 65

Dr Moses



No. 85 pages 97 & 99

Has complete drawings of Mercury pumps marked respectively No. 3 & No. 11. In the latter the construction is shown and referred to in writing on opposite page by Mr. Upton.

See also scrap book on Vac Apparatus

References for plate carbon.
(Weston vs Lateman vs. Edison

Note book No. 21 Page 163 (part)

Covered bars of carbon with copper film deposited by electrolysis, then exposed to fumes of sulphur to convert the copper film into sulphide, by this means obtained bars of carbon coated with films of copper sulphide.

(Lawson writing, probably October, 79)

Book No. 41 page 141.

730	290	160	July 21	Large Loop copper plated on shaft of carbon

Book No 41 page 185.

800	226	mch 6	6	the clamps [illegible] and broke the carbon. High Vacuum. Small loop copper plated 015 Copper pressed to 007

Book No 41 page 187.

No of Lamps	Before plating	After plating	Date	[illegible]	Notes
806	—		—	—	Small loop copper plated 015 Copper pressed to 007. Broken in Glass house
807	300		mch 6	6	Small Loop copper plated pressed to 007 Small crack on the inside globe could not get a vacuum

Book No. 41 page 187.

808	8.000	6,900	Mch 7	6	one fibre of Silk with copper ends.
809	250		7	6	2 Small Loops .015 Manilla paper pressed to .007 ends copper plated.
810	259		7	6	Same as above (Jm

(Book No. 41. contains record of lamps up to No. 973, the larger part of which are described as of copper plate ends)

Lamps

March 8th 1880
Chas Batchelor
M N Force

841 Carb 136, Bulb 70
Manilla fibre .007 thick pressed
copperplated,

842 Carb 129. Bulb 70
Palmetto leaf fibre - copperd

843
844 Palmetto leaf copperd

c 135
845 Carb 145
Fine threads

846 Wire grass from Florida
~~847~~ Copperd

Bad place at top

Book No 57 page 9 - (part)

Lamps

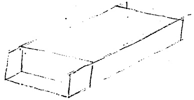
848
849 Palmetto leaf fibre copped

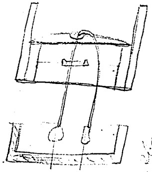
850
851 Small loop soaked in
852 starch and H.2.O. and
853 pressed carb 15#.

854
855 Palmetto leaf
856 copped

(Large portion of book No 57 devoted to carbon lamps with frequent descriptions of "copped" by Mr. Batchelor

Book No. 125 page 149



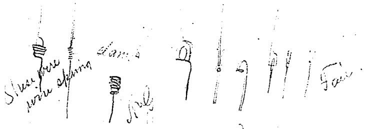


for heating the carbon
in clamps,

Book No: 126 - pge 163.

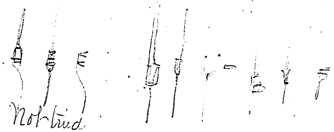
Dec 18 Different Ways for clamping Carbons for plating

Edisons suggestion



Satisfaction.

Edisons Sug.



Not tried.

F. G.

Book No. 70 page 162.

Lamps

Feby 23. 1880
Chas Batchelor

727 Carb Exp 74 — Bast fibre —
Paper ends soaked in thick sugar

---

728 Large loop — New sugared st
high R. 312 ohms —

729 Large loop — sugared with
No. 2 solution

---

730 One large loop dipped ends

Book No. 70 pge 182.

Mch 4, 1880

Make thin bass fibres coated with plumbago and sugar and copper plate the ends

---

Have Geo. copper plate the carbons

(Batch's writing)

806

This I found broken in glass house
I think by not washking
the copper plating solution it had
~~stain~~ broken out where the deposit made
C. B.

Book No. 70 page 187

Lamps Mch 6th 1880

805 Small loop copper plated
15 m - paper pressed to 7 m
clamps heated on pumps and
tested

806 Small loop - copper plated -
— x .015 paper pressed to .007 —
Broken in glass blowers

807 Small loop - copper plated
.015 paper pressed to .007
Small crack on inside globe
cannot get vacuum

808 One fibre of jute with
coppered ends
8000 ohms

(Batch's writing)

No. 70 page 190.

Lamps 2 small loops - 015 - vincal
809 } paper pressed to 007 - ends
810 } copperplated

811 Manilla fibre - ends copperplated
812 - Carb exp. 122 -

813 3 small loops 015 vincal paper
814 pressed to 007 - ends copperplated
815

816 Jute (fibres) number -
- (Carb 126) copperplated.

(Batch writing)
(to lamp No. 840 and near end of book a number of lamps are described as plated)

Book No. 104. page 1

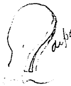
E.B.1. July 5 1880

Made a very diluted solution of Nitric acid got six elements of Bi chrom battery, made took a paper car. in clamps and put the battery on to it, it being first put in the solution, In the evening I went to look at it, I found that it was broken how I dont know, I noticed that one of the clamps was black, I put a new carbon in again
(2) And set the battery to work again on it In the morning (July 6) I took at it again and there was a thick deposit ~~on the~~ on one of the clamps (the zinc end)

No 1016 page 3

Ep 2

Made a diluted solution of
copper sulphate & took a
carbon in clamps and put
it into it and put one cup
of Daniels on it, let it worked
all night and in the morning
there was a deposit on the carbon
as shown in the



figure

I also have succeeded in plating these ends with copper nickel & other metals, which serves to make excellent contact between the clamps and the ends, I effect the deposit by hanging the loops upon a wire which is connected to one pole of a battery & allowing the ends of the loops to dip in the plating solution the proper distance, the jar containing the plating solution being in contact with the other pole of the battery –

(Mr Edisons writing)

(Copied in Caveat Book about Feby, 80)

Geo. Carman plating loops in the Laboratory — from same Dec 17 & 21 plating commercially at the lamp factory —

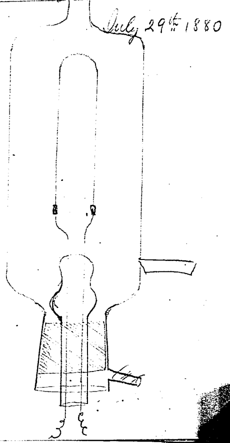
References on Equalizing the Resistance of carbons Maxim vs Edison.

Book No. 68, page 175

July 29th 1880

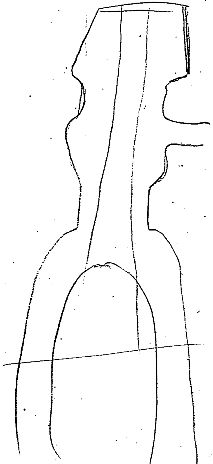
Part No 1 of carbon test app natural size too large

C. H.



B

Book No. 23 page 80½



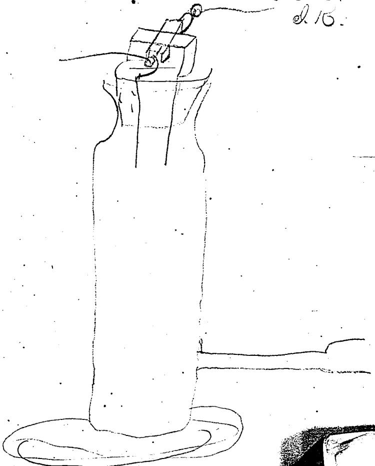
(No date on page. previous and subsequent dates are from Feb 22, 79)

No. 22 pge 27.

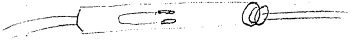
March 20. 1879

T.A.E.

J.K.



Book No. 42 page 51 (part)



passing vapors of Hydrocarbons
or carbonizable gases through
Hot tube to build up by deposit

(Mr. Edison's writing, probably Jany
or February 1880)

Lamp No 1323 July 24. 80
Heated to white in Kerosine

16 candles

(107 = D.
35.6

12.58 ohms

TAE

67.5 inches

(126 = D
4

5.41 6290
3800
10.090 Ohms

5.55 Took off current

No. 112 page 39

No 1323

80
26 3/4
5 3/4

1 a E

Kerosene oil lamp.
8 candles

937

65 1/4 inches

134
1.11.6

62.90
21.50
8.440

No 112 page 41

No 1323 Thos A Edison
July 26. 1880

9.48 Could not measure very easily but estimated 350 candles

7.2 ohms

160

53.3 Volts

10-1 Went at top of carbon 13 minutes

Book 112 page 43

Bast No 1324

Incandescent for a short time in oil T. A. E.

Book 137 p 53

Resistance cold 135.4 ohms

16 candles

86.9 ohms

716 volts

2620 ft. lbs.

12.5 per H. P.

Book No 112 page 45

No 1326 July 26, 1880

3.2 48 candles T.A.E.

6290
6290.
3720

11620.0

51.5 ohms

83.3 Volts

3760 ft lbs.

8.75 per H.P.

3.37 ~~Mult aba~~

Stopped machine

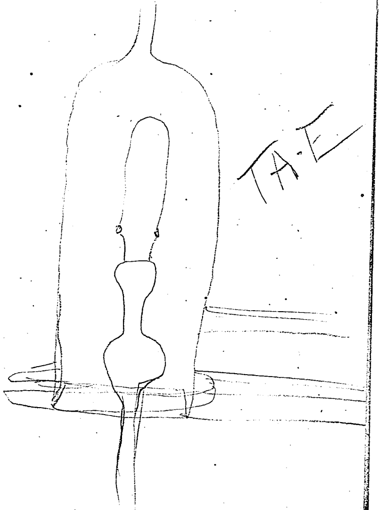
35 minutes

Page 47

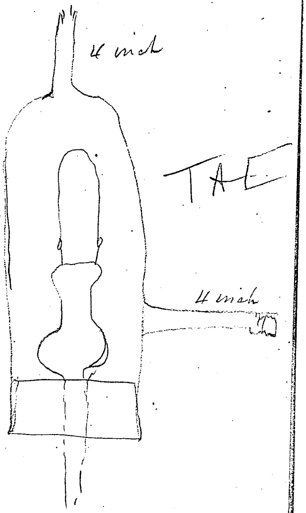
No 1324

4.53 Started T.A.E.

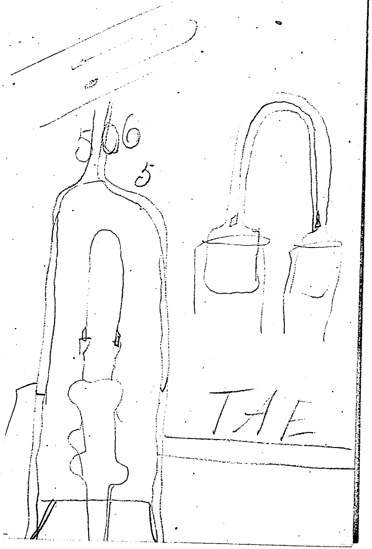
Book No. 112 page 280



TA-E


4 inch
TAE
4 inch

Book No 112 page 283.

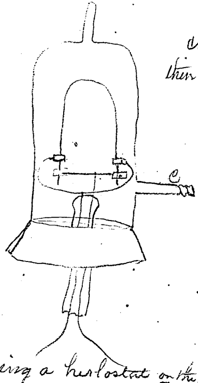


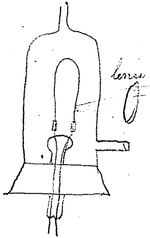
Patent

Oct 25 1880

T. A. E.
Chas Batchelor

chlorine first
then a volatile parafine





Using a rheostat on the arc,

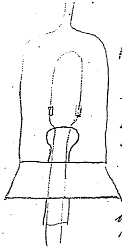
Tar may be put on at lower end & focus put on it

No. 60 page 3

Caveat

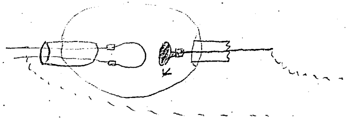
Oct 25, 1880

T.A.E.
Chas Batchelor



platinum nickel cobalt or other infusible metal brought to incandescence in a carbon vapor & carbon deposited it is then stripped off or it may be loosened by eating the metal.

Caveat Oct 25, 80
Chas Batchelor



Induction spark and heating loop same time - vapor of volatile parafin in tube or carbon X soaked in tar -
Electrical carrying coats carbon

Carbonize under pressure

See Exp Research - 5 page 132 -
Date previous to Feby 1.80

References for Field from separate sources of electricity — and Regulating the field by Resistances etc

Book No. 4 pages 105 + 107

"The Gramme machine was then used to run the magnet and a fearful pulling was the result as nearly all the currents were short circuited" ——

"Ex. No. 52 Feb 16. 1879
With one man power, Martin,
a fair arc could be obtained
from carbon points, a foot
of .001 In Pt was heated.
The commutators were connected
so that the current had to pass
through four coils, Large
sparks were obtained outside
the battery being used to make
the field magnets."

Book No. 4 page 111

"Ex 53.

The battery current was put from the top to the bottom commutator side of the Gramme and the ring revolved. No current or very little from the sides. Perhaps if the battery current were sent through at different E.M. it would work"

Book, No. 8, page 219

"Ex Put the Gramme through the Magnet and test its EMF. Also without Magnet in circuit.

No Ey".

Exp. Research 5 - page 98
Caveat dated March 17, 1879

"B is the field magnet which may be supplied with energy from the Ring a or from an exterior source"

Page 101-
"The operator now watches the Galvanometer and commences to insert resistance until the power of the magnet is so weakened" &c

Page 102. Suggests turning the brushes on the commutator to govern the strength of the current

Exp Research 5 page 107
Caveat Aug 7 1879

Mentions several ways & means of governing the electromotive force of machines.

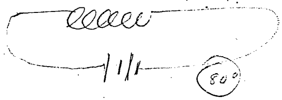
Page 128
Caveat dated Dec 19. 1879
"For energizing the field magnets of the subsidiary generators I use a dynamo electric machine, the current from which passes through the field magnets of all the subsidiary generators either in series or in multiple arc, in this circuit I place a large number of resistance coils of large wire and subdivided so that each has say 1/50 of an ohm, a wire between each resistance coil leads to a rotary commutator which in turning short circuits a greater or lesser number of resistance coils, thus increasing or decreasing the strength of the current in the field magnets etc

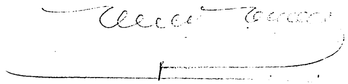
Note Book 12 page 11

"Running 250 Gramme Machine Co with batter,—

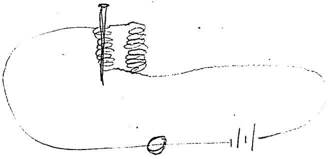
Same page 13.

Current diagrams



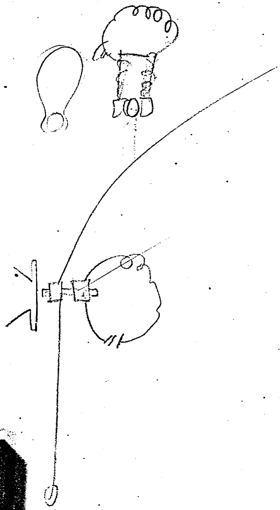


Book No 12 p 15 —



80'

About Dec 20th to Jan 1, 79
the date at head of experiment is
Dec 20, 78, [illegible]
date in book Jan 10. 79



Patent Office Gazett Vol. 7. P. 367
Edison's Patent No. 160,405. ~~dated~~
Filed July 29. 1873

The Speaking Telephone Interfe-
rence 24. Application No. 1440.
Resistance in use of magnets.

Also same Exhibit 32
39
" " "
Drawn 75 — 3d Sheet
Pat No 203,018 Apr 30. 1878
All same book.

T.A.E. U.S. Patents.

No. 147,311 Feb. 10, 1874.—
" 150846 May 12, 1874—
" 160405 Mch 2 1875—

Bill Book (Menlo Park)

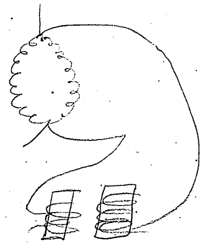
1 – 9 in Electrical Machine

$750 from Wallace & Son.

October 7th 1878.

Book No. 45 Page 38.

May 13. 1879 T.A.E



June 16, 1879

Results from Book 8 Page 91. Sinaci
Edison 2 piece probably 1120
8 ohms total 120 Volts
Circuit open 9.75
50 ohms 27.7 P. 94.
After bringing up field by short-circuiting 544 Volts
30 ohms 42.6 Volts
20.5 ohm 84.9
11.2 – 116
10.2 – 114
7.25 – 111

Gramme on field
15.35 ohms.
123 Volts

Book No 77 Page 3 —
(Same date)

New Machine Gramme on field

on field	E M F	R.
11 Webers	50.5 Volts	9.1 ohms
11	50.4	7.7 "
8.55	45.7	

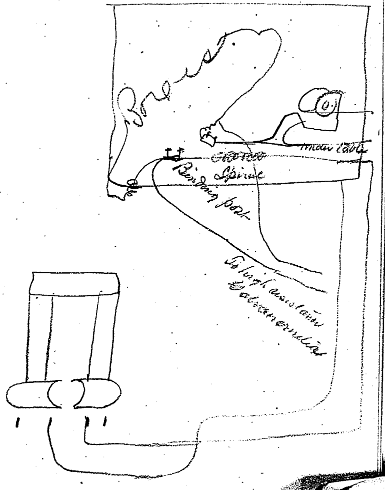
Running its own field

On 6.3 ohms	59.3	δ 2.18
6.35	63.5	
6.3	62	

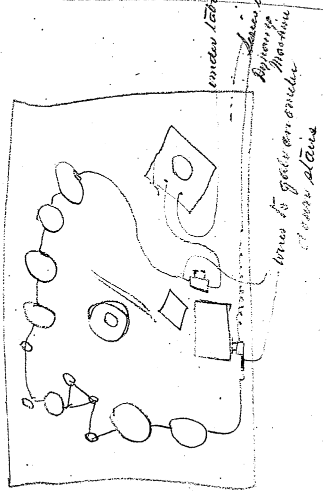
Refferences as above are a number of consecutive pages in Book No 77 - from page 1 —

Book No 77. Page 115

Probably last of June 79



Book 77 Page 116 Abt cast June 79



[ITEM FOUND IN BOOK]

Johnnie

Please send me the date the Wallace Machine was received at Menlo, by Saturday or write me, that I may go out to search for it myself, before the 11th

Yours

C. P. Mott

Desk Dynamo
Book 25 - page 13 = 14 = 15 -

No 28. p 82 -
No 13 p 8.

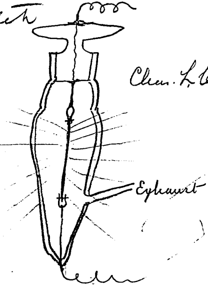
Ground Glass

Vol 22 p 27 - 29

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, ...188

Mr. Edison, I devised the lamp with ground stop cock in Feb. 15 1880 and tried the first experiment with it on Feb. 26th, The construction was as per sketch



Chas. L. Clarke

[ITEM FOUND IN BOOK]

October 7th 1878
1 - 9 in Electric Machine
$7.50.
Wallace and Sons

Bill Books

C.L. Clarke
Chroma Glass seal.

[ITEM FOUND IN BOOK]

Weston — Disc connections from bar side to comm=

Edison 25 — Statement—due July $\overset{30}{16}$. 1881

Clarke July & Aug 1880, says Mr E. made a sketch antedating him two or three weeks

Mr. Batchelor says John Ott made a machine in 1879.

Book No. 7 pages 117. 119. 125— No 2, p 39. No 1 pg 49. No 20 p. 206. No 23, p 69 etc. No 20 p 19. 33 etc— No 15 p 46. No. 41 p 17 etc— No. 28 p 11 etc— No 14— p 69. 117 etc— No 10 p 173 etc— 207— 247. No 11 p 31. 103— 12 p 119— Order book No 1 refers to Note book No 24 (not found) for a number of machines early in 1879—

No 13 p 8 etc. 39. No 14 p 167. 182 205— No 15 p 90— No 25 p 13 (0000) 15 etc— No 26 p 156— ~~[illegible]~~ No 29 p 125— No 46 p 19

Menlo Park Notebook #148 [N-80-10-08]

This notebook covers the period October 1880. The entries are by Edison, Francis Upton, and Francis Jehl. The book contains notes and drawings by Edison regarding tests made of the first 69 lamps from Lot 2. Included also are statistical results by Upton and Jehl. Tests of lamps 70-98 can be found in Menlo Park Notebook #149. The label on the front cover is marked "Lamps Lot 2," "Oct 1880," and "Francis Jehl." The book contains 284 numbered pages.

Blank pages not filmed: 30-31.

Index.

Lamps
Oct 8 1880

Francis Jehl

This is lot No2

~~This lot ...ked~~

~~No 2~~

212
1424
141 V

31400
3200
(173

880130

31400
5300
2367
183

121) 648600 (5360
363
730

3544) 33000 (9.3
31896
1040

No 1

E.M7 212 - 212

Res $\frac{31400 + 3200}{200}$

C 48 + 15.0 mins ✓

141 V
173 R
5090 FT lbs

Blue at the clamp

E.M7 182 - 181

Res $\frac{31400 + 5300}{200}$

C not blue in clamps at 16

121 V
183 R
3544 ft lbs
9.3 H.P

183) 648600 (352
552
966
915
510

183) 648600 (3544
549
996
915
810
732
180

~~slightly brig~~

perfect: no spots,

It was blue in the clamps.

Francis measured it after few minutes burning and it was only 36 Candles -

Now it is curious as he had tested it at 48 + made such a resistance that notwithstanding its blue it should have given 48, yet it only gives 36 apparantly it has leaked since test,

or — well what?

busted - Arc - R Coil burned

honeycombed ~~out~~ clamp on negative 8015

at last - burned out - 830

its going again on another R coil

208
3)416
138 V

355

31400

843650

178
177
3)355
151 V

3)355
115 V

163)585870 (3594

E. wt	208 – 208	138 V
R	$\frac{31400 + 500}{200}$	159 R
C	48	5243 files
	Hg in the globe	+ 17 others

E. wt	178 – 177	118 V
R	$\frac{31400 + 1500}{200}$	163 Res
C	16	3594 files

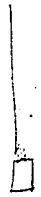
little bright

appears to be a
Crack here
[illegible]

Then

no blue at clamp

Res burned



[illegible]
negative

Arc Spring

No crack in
tits -
~~appears to be a~~

black deposit Carbon
on positive

I see few globules
of mercury inside
float at bottom.

224
223
0|441|
149V

31400
5100
200)36500(184

192
193
3|385
128

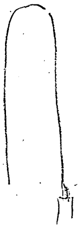
31400
7100
200)38500
192 Res

E.M.F	224 − 223	149 V 184 Res
R	$\frac{31400 + 5100}{200}$	5345 ftlbs
C	48	+ 5 Ohms ✓
E.M.F	192 − 193	128 V 192 R
R	$\frac{7100 + 31400}{200}$	3776 ftlbs
C	16	

192)725810(3776
576
1490
1344
1461
1344
1170
1152

No. 3

~~perfect~~ no spots



blue at clamps Reo burned

arc sprung

No cracks until

220
$3\overline{)440}$
146 ✓

31400
1500
$2\overline{)2900}$ (164 R
128
128
90

185
183
368
122 ✓

31400
...
176 R

Emt	220 – 220	146 ✓
		164 R
R	$\frac{31400}{200}$ + 1500	5767 fl lbs
C	48	
	Blue in globe	
Em7	185 – 183	122 ✓
		168 Rn
R	$\frac{31400}{200}$ + 7200	3924 fl lbs
e	16	

168)659360 (3924
504
1553
1512
416
336
700
672

no spots

Went in the glass
arc sprung.
It was blue in the clamps
but not on 1st reading

This lamp had no Res Coil

Glass all burst [illegible]

20/950
204/85
4.

202
204
3 | 406
135 V

15 3
4

25150
5100
20 | 30250 | 151 Res
204
182
180
25

172
172
3 | 344
114 V

25150
6400
| 31550

157 | 575120 | 3660
471
1042
942
1052
1049
10

5

Emf	202 − 204	135 V
R	$\frac{25150 + 5100}{200}$	151 Res
		~~6509~~ ft lbs
		5350
C	48	+20 Ohms

little blue in the globe

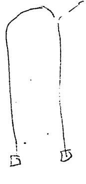
Emf	172 − 172	114 V
R	$\frac{25150 + 6400}{200}$	157 Res
		3660 ft lbs
C	16	

No spots

Blue at clamps

Res OK

bust there



big lot of
Moss Carbon

tits not cracked

215
215
3423 (?)
144 V

314 00
120 0
20)32600 (163 Res
126
126
68

182
2)364
121 V

314 00
174 R

$\frac{12}{16}$ $\frac{6}{8}$ $\frac{3}{4}$

Em 6	215 - 215	144 V
R	$\frac{31400 + 1200}{200}$	163 R
		5635 ft lbs
C	48 + 10 Ohms ✓	
Em 7	182 - 182	121 V
		174 R
Res	$\frac{31400 + 3500}{200}$	3727 ft lbs
C	16	

174)648600 (3727
522
1266
1218
480
348
1320
1218
102

little brighter

not blue in lamp

Square break

Reo ok
no arc

globe clear -

20|8000
40

223
223
3|446
148 V

31400
1300
20|32700 (163 R
126
68

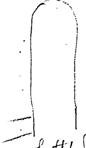
314
31
345
172.5

180
2
3|360
120 V

31400
3100
2|34500
172

E mf	223 - 223	148 V
		163 R
Res	$\frac{31400 + 1300}{200}$ + 6 Ohms	5953 ft lbs
C	48	
	little blue in globe	
E. mf	180 - 180	120 V
R	$\frac{31400 + 3100}{200}$	172 R
		3644 ft lbs
C	16	

172|627920 (3644
516
1119
1032
872
688
840

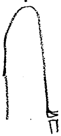


top edge of
tit on neg. side
little fused

little [illegible]

Arc sprung Res burned

Tit cracked
but only around
top



here
negative

blue on clamps

212
2
3|424
141 V

3|400
1100
20)33500(162
120
125
120
50

179
2
3|358
119 V

31400
29
2|34300
171

171)627330(3668
513
1143
1026
1173
1026
1470
1368
102

171
1368

Emf	212 − 212	141V
R	$\frac{31400 + 1100}{200}$	162R
		5436 ftlbs
C	48 +14 ✓	
E.mf	179 − 179	119V
R	$\frac{31400 + 2900}{200}$	171R
		3668 ftlbs
C	16	

8 Mosfeg.

Blue at clamp x

Split in Clamp

Res burned - Arc

Sprung

Split clamp on negative side and there -

top of tit on negative plat fused no cracks in tits

215
3430
143 ✓

31400
3200
28600 (173
...
60

180
...
120 ✓

31400
4800
...
181

181) 637920 (3524
543
949
905
442
362
800
724

Emf	215 - 215	1430
R	$\frac{31400 + 3200}{200}$	173 R
		5236 fields
C	48 + 12 ✓	
emf	180 180	1200
		181 R
	$\frac{31400 + 4800}{200}$	3524 fields
C	16	

9 no spots

Burned its Res - but Lamp Ok - but I notice that there has been internal arcing in Carbon at clamp

Martin puts in another Res & arc sprung.

burned Res again

Howell says no blue but

Clamp little black towards position

no cracks in tits

185) 642331 (3472
555
873
740
1333
1295

226
225
451
150 V

31400 386
3500
34900 (174 R
204
148
90

185
186
371
123 V

31400
5100
37100
185

185) 670210 (3623
555
1152
1176
421
260

104.4
1044
4176
4176

185) 642331. (3361
555
873
555
318

1087936
44.3
4349808
5799744
574 9744
6423310648

10

EMF 226-225
Rs. $\frac{31400 + 3500}{200}$
c 48

150 V
174 R
5728 ft
+3 V

Blue at the clamp

EMF 185-186
Res $\frac{31400 + 5700}{200}$
c 10 not blue at 16

123 V
185 R
3623 ft

$\cdot 18 = 32^{1.079}$

3623
3472
151

185
166
64) 376 (5.7
320
560
448
6

568
18
464
58
10444

510
448
62

104
104
416
104
10816
44.3
32448
43264
43264
185)4791488 (2589
370
1091
925
1664
65

3???
2589
1034

2589)33000 (13.
2589
????
????
4??

No 11

little low no spots

blue at clamp on first reading by Martin - not blue on Howells reading

arc sprung = had scarcely any wire on Reo coil = platinum leading wire burned off at tit.
+ Carbon broken at top probably mechanically = I notice a crack in one of the tits perhaps air passed in + that made the arc

~~[illegible]~~ neg til fused at top.

Crack in Positive tit

227
225
$\frac{...}{1452}$
150 V

31400
21) ...
178 R

191
3381
1270
1857 R

31400

191
190

Cut 227 – 225

150 V
178 R
5599 ft lbs

Res $\frac{31400 + 24300}{200}$

@ 48 +.4 ✓

Cut 191 – 190

Res $\frac{31400 + 45600}{200}$

@ 16

11 - nospots ~~neg~~

(Marked at factory) (split in clamp) - I find split was at negative pole -

arc sprung - Res Coil burned but 2 turns on it - platina wires fused off at negative tit ~~tits~~

Howell says no blue but clamp to Positive black. - negative tit cracks but probably by melting of platina - Think Carbon was intact & broken mechanically

$3\overline{)420}$
140 V

25150
5100
$20\overline{)30250}$ 151 R

$3\overline{)348}$
116 V
159 R

25150
6700
$20\overline{)31850}$

Ent	210 - 210	140 V 151 R
R	$\frac{25150 + 5100}{200}$	5750 ft lbs
c	48 + 14	
Ent	174 - 174	
	$\frac{25150 + 6700}{200}$	
c	16	

12 no spots

Blue at clamps

Busted arc'd - Res

burned

plat wire wire fused
1/4 inch from glass tit positive side
& top of tit fused at negative

Carbon intact
only separated from
wide part
of thick end

arc'd & split in clamp

Honeycombed.

Negative Dark

Little

218
214
...
144 V

31400
200
2)31...
158 R

180
2
3)...
120 V
168 R

3140-0
230 0
2)...
158

13

Elut	218 − 214	144 V
R	$\frac{31400+200}{200}$	158 R
		5813 [illegible]
C	48	+ 10 ✓
E	180 − 180	120 ✓
Res	$\frac{31400+23000}{2000}$	
C	16	

13 no spots; Lot 2

Blue at clamps

Went at 4.05 P.M. Oct. 16.

222
226
2)448
149 V

31400
2500
2)33900
169 R

207
203
3)410
136 V
177 R

31400
4100
2)35500
177

Elut	222 − 226	149 V
R	$\frac{31400 + 2500}{2000}$	169 R
		5819 ohms
C	~~16~~ 48 + 5 V.	
	Blue at the clamp.	
Elut	207 − 203	136
R	$\frac{4100 + 31400}{200}$	177 ohms
C	16. Blue at 16	

14 nospots low red
just visible
blue in clamp — busted
are sprung Red burned
platina wires burned at tit

I notice there is a resistance
Coil in here of 2 turns yet
this lamp was awful
low as compared to the others
platina fused down in positive tit
Negative tit fused at top —
Beautiful shining carried Carbon or plumbago
of Carbon at Positive Side

cut filament
as if arced internally
where it broke

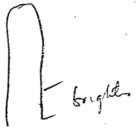
$$\begin{array}{r} 210 \\ 212 \\ \hline 3|422 \\ \hline 140\checkmark \end{array} \qquad \begin{array}{r} 2|31400 \\ \hline 157\ R \end{array}$$

$$\begin{array}{r} 170 \\ 2 \\ \hline 3|340 \\ \hline 112\checkmark \\ 168\ R \end{array} \qquad \begin{array}{r} 31400 \\ 2200 \\ \hline 2|33600 \\ \hline 168 \end{array}$$

15

Elm 7	210 212	140 V 157 R 5530 ft less
R	$\frac{31400}{200}$	
C	48	+ 15 ✓
	Blue at the Clamp	
Elm 7	170 – 170	113 ✓
Res	$\frac{31400 + 2200}{200}$	168 ohms
C	16	
	Listen Blue at the Clamp	

15 -



Blue at clamps

~~Res~~ arc sprung
Res busted or
rather burned —
Carbon appears
Intact —

198
196
3)394
131 ✓

25150
3500
20)28650 (143 R
20
86
80
65

163
164
3)327
109 ✓
152 R

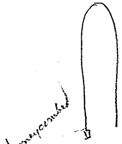
25150
5300
20)30450 (152
[illegible]

Em7	198 − 196	131 ✓
		143 R
R	$\frac{25150 + 3500}{2000}$	5316 [illegible]
		+ 24 ✓
C	.48	
	Hg in The globe	
Em7	163 − 164	
R	$\frac{25150 + 5300}{200} = 152$ Ohms	
C	16	

no spots.

Blue at clamps

Restarted =



Carbon not frosted
but honeycombing
gave vapor carbon
+ formed arc

Mercury in globe

230
226
2)456
152 V

31400
5400
36800
184 R

195
195
2)390
131.5
194 R

31400
7500
...
194

17

E.m7 230 − 226 | 152 V
184 R
5560 fells

R $\frac{31400 + 5400}{200}$ + 1 ✓

C. 48
Blue in clamp

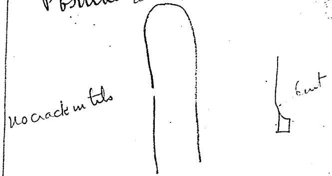
Em7 195 − 195 | 130 V

$\frac{31400 + 7500}{200}$

C 16
Not blue at 16

17 — no spots.

blue at clamp No wire
Carrying shiny towards
Positive and little over on



other side towards the glass
blacks spots 1/4 inch long
Many shiny spots.

Little Hg in globe

$$\begin{array}{r} 215 \\ 218 \\ \hline 3\,)\,433 \\ 1445 \end{array} \qquad \begin{array}{r} 31400 \\ 2500 \\ \hline 2\,)\,33900 \\ 169\ R \end{array}$$

$$\begin{array}{r} 185 \\ 185 \\ \hline 3\,)\,370 \\ 1235 \\ 179\ R \end{array} \qquad \begin{array}{r} 31400 \\ 4500 \\ \hline 2\,)\,35900 \\ 179 \end{array}$$

18

EM7 215–218 1445
169 R

R $\frac{31400 + 2500}{2000}$ 5438 fllo

+29 √

C 48

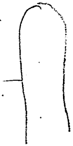
little blue at the clamp

EM7 185 – 185 1235

Res $\frac{31400 + 4500}{200}$ = 179 ohms

C 16 not blue with 16

~~Hot spots~~ 18 -



slightly brighter

Blue at clamps slightly

Lot - 2

broke 2,30 P. M. Oct-16

positive -

no resistance.

215
212
431
143 V

31400
2000
33400
167 R

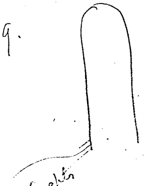
186
...

31400
3500
...

14900
174

Enit	215 – 216.	143 V
R	$\frac{31400 + 2000}{200}$	167 Res
		5424 fills
C	48	+12
	Blue at clamps	
Enit	186 – 186	12.45
R	$\frac{31400 + 3500}{200}$ = 174 ohms	
C	16	
	not blue at 16	

19.



No crack in tils

Blue at clamps

Res Coil burned
arc Spring

$$\begin{array}{r} 209 \\ 210 \\ \hline 3\,|\,419 \\ 139\text{ V} \end{array} \qquad \begin{array}{r} 31400 \\ 200 \\ \hline 2)\,31600 \\ 158\text{ Res} \end{array}$$

$$\begin{array}{r} 175 \\ 177 \\ \hline 2\,|\,352 \\ 117 \end{array}$$

20

Elut	209-210	139V
R	$\frac{31400+200}{200}$	158R 5410 Res
C	48	+16 ✓
	Little blue at one clamp	

Elut	175-177	117 Volt
R	$\frac{31400+1700}{200}$ = 165 Ohms	
C	16	

20
no Spots!

Blue at clamps

Res burned arc spring

240
242
2)482
160 ✓

31400
27000
2)34100
170 R

215
216
2)431
143

21

M.T. 240 – 242 — 160 ✓

R $\dfrac{31400 + 27000}{2000}$ — 170 R, 6671 ft lbs

C 48 Too high

Blue at Clamp and Hg in globe

M.T. 215 – 216 — 143 ✓

R $\dfrac{31400 + 45000}{2000}$ = 1790 hrs

C 16

Blue at Clamp
at 16 –

21

No Res Carlin it
Are spring glass
all bused up =

Blue at clamp x

204
205
3)409
126 √.

25150
2500
200)27650 (138
26
165

172
175
3)347
115.6

22

Curt 204 − 205 | 136 U
138 R
5937 lt

R. $\frac{25150 + 2500}{200}$

C C 48 +57 √

Blue at the clamp & Hg in globe

Curt 172 − 175 | 115.6

R $\frac{25150 + 4500}{200}$ = 148 ohm

C 16

Blue at the clamp and Hg in the globe.

72

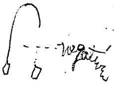
little dull no spot

Not blue at clamp

After burning some 4 hours,
looked badly spotted,
also blue at positive clamps.

broke at 11.40 A.M. Oct-14.

Mr Edison changed the poles
a few minutes before it
broke, carbon then almost
entirely gone.



212
2
424
141

25150
110

182
182
364
121

23

Cut 212 - 212

141 ✓
155 Rcs
5682 pcls
5682

R $\frac{25150 + 5900}{200}$

C 48 +13

Blue at the Clamp

Cut 182 - 182 12-18

R $\frac{25150 + 7600}{200}$ = 163 Ohms

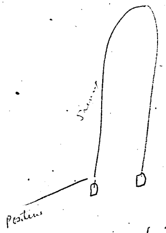
C 16

Blue at 16 C

4.2984382
1.6464037
7.8096683
13.7545102 = 5682.

23 - no spots

Blue at the clamps



Res ok - no arc -

232
230
3|462
154 V

31400
500
20|329 00
159 R

314
29
2|343
171

195
195
390
130

24 Oct 9

E 1117 ~~213 – 215~~ 232 – 230 154 V

Res $\frac{31400 + 500}{200}$ 159 R

6610

C 148

Blue at the clamp

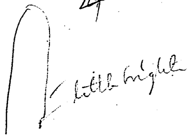
E 1117 195 – 195 130 V

R $\frac{31400 + 2900}{200}$.

C 16

Blue at 16 candles

2/4



This spot is growing fearfully bright at spots = just busted & busted at bright spot. it was blue on clamps badly Carrying in carbon - showing deposit on Carbon toward the positive - This lamp has no Resistance Coil.

Blue at Clamps

I notice these Cracks in metal of nickel Clamps both poles Coated at Cracks with Carbon

25

Could not get This
one up to 48 C
It was blue at the
Clamps. Res high

25 - low no spat,

Blue at Clamps

No Resealain

are Spring

Glass all bisected

215
3)430
143

25150
4600
20)2975 148

26

E.117 215 - 215 143
R $\frac{25150 + 4600}{200}$ 148 R
+10
6120
C 48

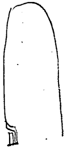
Blue at clamp - but little

Emt 176 - 178 118
R $\frac{25150 + 6600}{200}$
C 16
not Blue at 16

26 - no spots - quite bright

Res Coil - burned -
arc spring -

Shop card says split at clamp



Lampblack fog towards negative

Blue at clamp.

Top negative tit fused -
platinum melted off on positive
Considerable black deposit on
Negative as well as Positive
~~Carbon~~ Clamp split at Positive

229
230
2)459
153 ✓

31400
5000
2)36400
182

Em7 229 – 230 153 ✓
182 R

R $\frac{31400 + ~~5000~~ 5000}{2000}$

C 48 5690 ft. lbs

Blue at the Clamp and Hg in the glob

Em7 200 – 201 137

R $\frac{6600 + 31400}{2000}$.

C 16

Blue at 16

27 - no spots - low

Bushed in glass all to pieces. - no Res
Coal with this lamp

Blue at clamp

218
2

3 | 436
145 V

314 00
23 00
2 | 337 00
168 Re

314 00
38 00
2 | 352 00
176

185
187
3 | 372
1

28

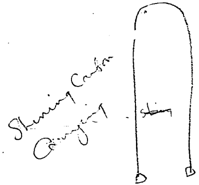
E.M.7	218-218	145 V
		168 R
R	$\frac{31400 + 2300}{200}$	+ 9 V
		5540.
C	48	
	Blue at 48 at the Clamp	
E.M.7	185-187	126
R	$\frac{31400 + 3800}{200}$	
C	16 Blue at 16 at the Clamp	

28

no spots

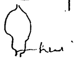
Blue at clamps

Res OK - no arc



No crack in tits = Mercury in globe

Cracked badly where sealed -



$\frac{205}{200}$

$3 \overline{)410}$
136✓

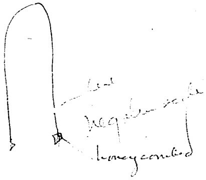
$\frac{31400}{2500}$
$2 \overline{)33900}$
169

29

EMY	205 - 205	136✓
R	$\frac{31400 + 2500}{200}$	169 REQ
		+ 21✓
C	48	4850
EMY	177 - 178	118 3
R	$\frac{31400 + 3800}{200}$	
C	16	

29 - no spots

Blue at clamps



Res OK - glass clean

212
212
3 | 424
141 V

2 | 314
157

31400
...
160

184
185
369
3 | 369
123

30

Em7	212 – 212	141 V
R	$\frac{31400}{200}$	157 Res +13 ✓
		5610
C	48	
	Blue at the clamp	
Em7	184 – 185	123 V
R	$\frac{31400+1300}{200}$	
C	16	
	Little Blue at 16 at the Clamp	

30 Slightly-(very) Spotty
different places

Blue at clamps

depositing Carbon on
positive side a few places
no negative side. alternating
with very black spots.

Mercury in globe - not cracked
in tits natural that splitty
nickel metal is coated
with Carbon on Positive at Cracks
I guess its the points that
attract.

30 Slightly-(very) Spotty
different places

Blue at Clamps

depositing Carbon on
positive side & few places
no negative side. alternating
with very black spots.

Mercury in globe - not cracked
in tits [illegible] splitty
nickel metal is coated
with Carbon on Positive at Cracks
I guess its the points that
altered.

$$\begin{array}{r} 230 \\ 3)\overline{460} \\ 153\ V \end{array} \qquad \begin{array}{r} 31400 \\ 2)\overline{37100} \\ 185\ R \end{array}$$

200
200
3)140
740
200)
197

31

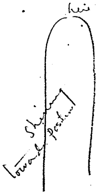
Emf	230 - 230	153 V 185 R
R	$\frac{31400+5700}{200}$	5600
C	48 C Blue at the clamp	
Emf	205 - 205	136
R	$\frac{31400+7400}{200}$	
C	16 Blue at the clamp	

31 —

bright

I notice that there are air bubbles 1/16 down into Each tit on platina did heat bring the air out platinum

busted — (Shop slip says Split in clamp)



no Reo Coil —

Blue in clamp

no crack in tits

neg nickel clamp no change looks as if just put in

212
2
424
141✓

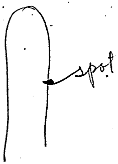
25150
5900
31050
155

25150
7500
32650
163

179
180
359
179

Out	~~220~~ ~~222~~ 212 – 212	141 V
R	$\frac{25150 \quad 5900}{200}$	155 Res + 13✓
C	48 Blue at The Clamp	5680
Out	179 – 180	120 V
R	$\frac{25150 + 7500}{200}$	
C	16	

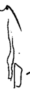
32



Little Hg in globe

Res Carb burned - arc

sprung



undoubtedly split in clamps & arced there

Carbon OK

top lit on negative fused

Blue at clamp

plat wire fused 1/4 inch up on Positive

$$3\overline{)426} = 142$$ ✓ $$2\overline{)326} = 163$$ ✓

Emf 213—213 142 ✓ 163 Rcs

R $\frac{31400 + 1200}{200}$

C 48 +13 ✓ 55 30

Emf 176—176 117 ✓

R $\frac{31400 + 3000}{200}$

C 16

124 3/11

99
99
891
891
99 0 44
39204
39204 244
43 1
372 2
39 6
49 64
9

124 3

34

33 nospots.

Blue at clamps slightly
- Res burned - are
Sprung -

Little H q in globe

negative
Honeycombed

$$\begin{array}{r} 224 \\ 225 \\ 3\overline{)449} \\ 149 \end{array}$$ V

$$\begin{array}{r} 314 \\ 45 \\ 2\overline{)359} \\ 179 \end{array}$$ R

3 1 4 00
5 8 0 0
200 | 3 8 2 0
1 9 1

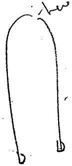
194
194
2 | 388
129

34

Clw 7	224 – 225	149V 179 Res
Res	$\frac{31400 + 4500}{200}$	+ 5 ✓ 5500
C	148 Blue at the Jump	
Clw 7	194 194	
R	$\frac{3\cancel{14}\cancel{00} + 6000}{200}$	
C	16 not Blue	

34
slightly spotty

Blue at clamps



here

slightly fuzzy on positive side

Shiny here

positive

not so good cavity
at neg + clamp End
clean as as of
just put on

hits no crax

Res OK no arch

by hitting Cathode arc
Keeps up when top 1/2
inch away

217
217
2|434
144V

314
29
2|343
171R

178
118V

314
181 Res

181·
8
1448

343
738
784
1430

(3407

Second lot.

Ent 217 − 217

R $\frac{31400 + 2900}{200}$

C ·48

144V
171R
+11√
5370

Blue in globe

Ent 178 − 178

R $\frac{31400\ 4900}{200}$

C 16

118V
181 Res
3407 ftlbs

2·0718820
4·147766
7·646407
7·742214
3·5324·0891

30407

34

no spots - bright

here

Shopclip
Says it is
broken at clamp
but way out so
dont make much
difference

Res OK

no arc

Globe blackened
very much

Blue at clamp

no crack in til

Notice in blackened globe that
there is a white streak no deposit
in this is parallel to Carbon
Cant say which pole = both
clamps perfectly clean

3 | 460
153 V

314
43
2 | 357
178 R

192
3 | 380
126 V

31400
6600
2380
190 R

19) 70331 (3701
57
133
133

2.1846914
4.36938.28
1.6464037
7.7495791
3.7653656

5825.9

S.M.F	230 - 230	153 V 178 RES.
R	$\frac{31400 + 4300}{200}$	
C	48	5820
All F	190 - 190	126 V 190 R 3701 fells
R	$\frac{31400 + 6600}{200}$	
C	16	
C		

1846914
2.3693828
1.6464037
7.7495791
01.7653656

36. No Spots

Blue at clamps

are sprung — No Res
Clamps not black. Carbon
intact. both platina
wires burned off at
lits — globe clear

3 | 420
140 V

314
24
2 | 338
169 Res

~~178~~ 175
2
3 | 350
116 V

31400
4200
2 | 357
178 R

178) 591400 (3324
534
621
178
0430
356
740
712

Emf	210 − 210	140 V 169 Res
R	$\frac{31400 + 2400}{200}$	+16
C	48	5120
	Blue in globe	
Emf	175 − 175	116 V 178 R 3324 ft lbs
R	$\frac{31400 + 4300}{200}$	
C	16	

1

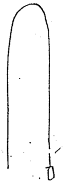
117.
117
819
117
117
13.689
44
54756
54756
602316
4500
177) 606.816 (3428
531
758.
708.
507
354
1476

177

33000) 9
31057
1948.

37 No spots

~~not blue at clamp~~



Glass little dirty
Res OK No
arc —

247
2
3|494
164 V.

3765
3650

37650
8500
200|46150 230

3|420
140

37650
11200
48850

244) 355280 (3558
1472

355

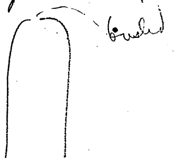
2080

Elu 7	247 · 247	164 V 230 Res
R	$\frac{37650 + 8500}{200}$	
C	48 Blue in globe	
Ant	210 − 200	140 V 244 R 3558
R	$\frac{37650 + 11200}{200}$	
C	16	

38

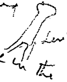
Bright over top

It went where bright spot was



No Res Coil = did not arc split in clamp blue on clamps -

White looking opalescen at top of sealing



think there is a crack in the lit -

$\frac{212}{210}$
$3\overline{)422}$
1

314
20
2 | 334
167

175
177
3 | 352
117

39

Cut	212 – 210	~~EA~~ Volts 140.6
R	$\frac{31400+}{2000}$	157 Ohms
		+ 13 √
C	48	5610

Blue in the globe

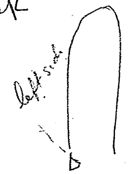
Cut	175 – 177
R	$\frac{31400+2000}{2000}$
C	16

39

Bright on whole left side

Not blue on clamps

Res OK



No arc

a legitimate
bustup

171
168
3 | 339
113

314
22
2 | 336
168

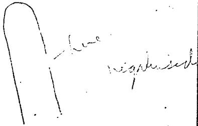
Emf	200 - 205	135 Volts
R	$\frac{31400}{200}$	157 ohms
		+21 V
C	48	5140
Emf	171 - 168	
R	$\frac{31400 + 2200}{200}$	
C	16	

40

Mo Spots

Not blue on clamp

Resistance burned
arc spring
platina melted after at
~~1st got~~ positive lit



probably spot accounts for
throughout Vapor & arc
Spring.

25150
4500
205 | 30650 | 153
20
1060
1000
65

173
173
2 | 346 | 173

Elm7	207 — 207	138 Ohm
R	$\frac{25150+4000}{200}$	146 Ohms
		+16
C	48	5780
	little Blue	
Em7	173 — 173	
R	$\frac{25150+5500}{200}$	
C	46	

41

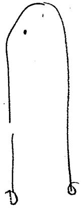
No Spots

Not blue arc lamps

No arc Residue

Carb Ok

negative



25150
5700
200 | 30850 | 154
200
1150
85
85

168
168
2 | 336
112

EM7 197 - 197 131.3 Volts

R $\frac{25150 + 5100}{200}$ 151.2 Ohms
+25

C 48 5020

EM7 168-168

R $\frac{25150 + 5700}{200}$

C 16

42

No spots

Blue on clamps slightly

Large blue on clamp

Res burned are Spring

Negative clamp honey(comb)

badly - Carbon not

wholly broken He

Connects it again & it goes

OK - & then again

again it busted at top

31400
3250
200 | 34600
173

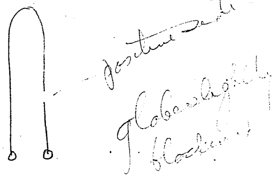
179
179
2 | 358
179

EMF	205 - 205	137 Volts
R	$\frac{31400 + 1500}{200}$	164 Ohms + 19
C	48	5060
	little, Blue in glob	
EMF	179 - 179	
R	$\frac{31400 + 3200}{200}$	
C	16	

43

No Spots

Not blue on clamps



No arc Res Of

This lamp had been put in wrong pole, hence Break now on P was burned longest on Neg

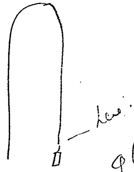
31400
5200
200 | 36600
183

180
180
3 | 360
120

44

Emf	217 – 217	145 Volts 174 ohms
R	$\frac{31400 + 3400}{200}$	+ 9√ 5350
C	48 Blue in the glob.	
Emf	180 – 180	
R	$\frac{5200 + 31400}{200}$	
C	16	

44
No Spots



Res OK – no arc

Not blue on clamp

Slightly honeycombed in clamp
Clamps perfectly Clean
no cra

25150
7300
32450
2 | 324.7
204
120
120
45

| 162

166
167
2 | 333
111

Hg in the lobe

Elw4 198 - 198 — 132 Volts, 1530 ohms

$\frac{25150 + 5500}{200}$ +24

R

C 48 — 5040

Blue in the lobe

Elw7 166 - 167

R $\frac{25150 + 7300}{200}$

C 16

41

No Spots

not blue at clamps

Res burned - are Spring

fearfull lot of
mercury w. globe
dirtied top 7/46

here
cracked & also
honeycombed

It was broken in large
part Carbon undoubtedly
by too tight clamping or
otherwise.

No blue on
Clamps

173
173
3 | 356
118=9

31400
1800
200 | 332
166

46

Out 203 - 204 136 Volts

R $\frac{31400\text{ out } \cancel{3}}{200}$ 157 Ohms

+20√

C 48 5230

Out 173 - 173

R $\frac{31400 + 1800}{200}$

C 16

46

Low Slightly brighter
on Right hand side
near top

Blue on clamp

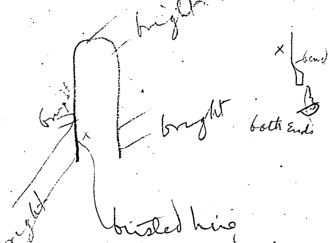
31400
9800
41200
200 | 412 | 206

185
187
3 | 372 | 124

47

Emf	Emf 223 – 225	148 Volts
R	$\frac{31400 + 7000}{200}$	192 Ohms
		+ 6.
C	48	5050
	Blue in the globe	
Emf	185 – 187	
R	$\frac{31400 + 9800}{200}$	
C	16	

47



Think it arced but Cant say

The Res Coil of 47 got very hot and silk burned but lamp OK -

Not blue on clamp

Shop Slip says Split in clamp but found it very tight --

31400
4900
200 | 36300
181

180
175
3 | 355
1.18

48

217 – 220 146 Volts

$\frac{31400 + 2900}{200}$ 171 Ohms

+ 8

48 5530

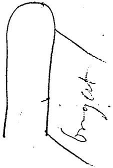
Blue in the globe

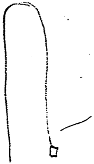
180 – ~~157~~ 0175

$\frac{31400 + 4900}{200}$

16

Brightest near bottom





buckled in Carbon at

not blue but g

notice clamp block

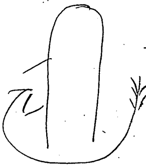
No cracks in tits.

Opalescence at ∧ top

This lamps ~~was~~ resistance is very high.

49

Dull



little bright
near centre of
left hand side

Twas thru clear, Arcd - had
frosted glass - Knocked hole
in it = There is no Res
Coal with this lamp

$3\frac{14^0}{75^0}$

$2\left)\frac{3\,9\,9}{1\,9\,9}\right.$

$\frac{177}{178}$

$2\left)\frac{355}{178}\right.$

50

Cur 208–204 137 Volts

R $\frac{31400 + 5700}{200}$ 185 Ohms

+22

C 48 4450

Blue ~~ed~~ in the globe

Cur 177–178

R $\frac{31400 + 7500}{200}$

C 16

50

Little brighter on left hand side

N.a.t. blue on clamp

5 = Honeycombed. when split carbon at clamp negative side.

Res Burned : arc sprung

Carbon Mechanically broken

Melted platina wire off at positive ~~lit~~

didnt fuse top of lid on negative platina —

Mercury in globe

25150
7300
200 | 32450

172
170
342

51

Ext 205 - 205 137 Volts

154.2

R $\frac{25150 + 5700}{200}$

C 48 +18 V

5400

Ext 172 - 170

R $\frac{25150 + 7300}{200}$

C 16

51

No Spots

split clamp

Not blue an clamp

31400
9100
200 | 40500
202

192
192
384
...
...

Emf 228 - 228 152 Volts

R $\frac{31400 + 7600}{200}$ 1970hms +1 5190

C 48 Blue in globe

Emf 192 - 192

R $\frac{31400 + 9100}{200}$

C 16

52

No Spots

Carbon Intact - glass OK
but an arc sprung and
burned platina leading
wire off at tit = This lamp
had no resistance coil,
but about 2 inches wire -

No blue in 52 in clamps

25150
7200
200 | 32350 | 161

1790
1210
3310

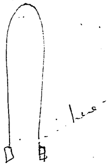
last one of this lot

Elw'y	200 − 198	133 Volts
		158 Ohms
R	$\frac{25150 + 5500}{200}$	+ 24 V
C	48	4960
Sw'y	170 − 170	
R	$\frac{25150 + 7200}{200}$	
C	16	

53

No Spots

Not blue on clamp



glass clear - Res OK

$$\begin{array}{r} 31400 \\ 6000 \\ \hline 37400 \end{array}$$

$200 \overline{)37400}$ 187

$$\begin{array}{r} 185 \\ 185 \\ \hline 370 \end{array}$$

$2 \overline{)370}$ 123

54 Receive this lot Oct 11 1880

Ellif 220 220 — .147 Volts, 178 ohms

R $\dfrac{31400 + 4200}{200}$ — +7 ✓

@ 48 — 5380

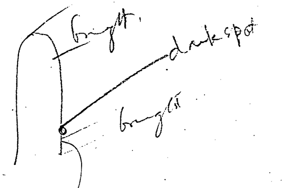
Blue in the [illegible]

Ellif 185 – 185

R $\dfrac{31400 + 6000}{200}$

@ 16

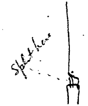
54



Busted here, Res OK

No arc - Globe little blackened

Not blow on Clamp



31400
3100
200 | 34500
172

172
172
3 | 344
1 ~~14~~ 5
115

55

EMF	210 ~~2~~10	140 Volts
R	$\frac{31400 + 1300}{200}$	163 Ohms +15 ✓ 5320
C	48 little Blue in Globe	
EMF	172 – 172	
R	$\frac{31400 + 3100}{200}$	
C	16	

54 no spots

Not blue on clamp

Res OK

[illegible] positive Sch

Busted

No arc

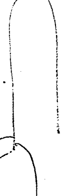
178
181
359
179

31400
5400
$200 \overline{\smash{)}36800}$
184

#56

Em 7	220 - 220	147 Volts
		179 Ohms
R	$\frac{31400 + 3800}{200}$	+9
		5346
C	48	
	little Blue in globe	
Em 7	178 - 181	
R	$\frac{31400 + \cancel{5}400}{20}$	
C	16	

56



Graphite

lite not Crooked

Busted here - Res Coil

Burned Arc spring

Very blue lamp

Bulb bent here

thick end on negative

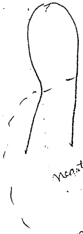
Honeycombed

180
183
2) 363
121

31400
6000
200) 37400
187

EW7	212 – 212	141 Volts 179 ohms
R	$\frac{4400 + 31400}{200}$	
C	48	+ 15 √
		4920
EW7	180 – 183	
R	$\frac{31400 + 6000}{200}$	
C	1·6	

57



little bright

near the side Not blue near clamp

Pos clamp little black.

But at bend where there was bright spot.

Res OK - Glass much blackened - Strap slip.

Ilays busted at clamp

180
179
2 | 359
119 120

31400
4000
200 | 35400
177

EMF 215 − 214 143 Volts

R $\frac{2600 + 31400}{2000}$ 170 Ohms
+12
5330

C 48 little. Blue in globe

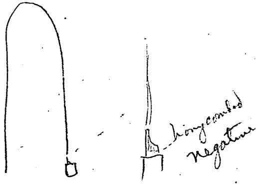
EMF 180 − 179

R $\frac{31400 + 4000}{200}$

C 16

58 -

both unequal



Res did not burn
No blue in lamps
No crack in lit

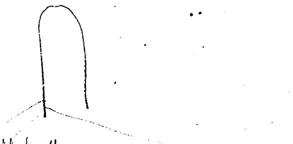
$$\frac{175 \cdot 175}{2)\,350}\quad 175$$ 6 17

$$\frac{314 + 45}{2)\,359}\quad 179$$

59

Emf	210 – 210 140 Volts
R	$\frac{31400 + 2500}{200}$ 169 Ohms + 16
C	48 5120
	little Glow in Globe
Emf	175 – 175
R	$\frac{31400 + 4500}{200}$
C	16

59.



with bright.

arc spring Res

burned - Carbon broken

at clamp on negative side

No blue at clamp

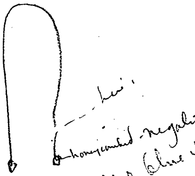
31400
4300
——
35700
200 | 178

185
185
——
370 | 123

60

EMF	215 – 215	145 Volts
R	$\frac{31400 + 3000}{200}$	172 Ohms
C	48	+9 ✓ 5420
EMF	185 – 185	
R	$\frac{31400 + 4300}{200}$	
C	16	

60 OK no spots



no blue in clamp

arc must have sprung

Resistance formed glass + plat wires OK = The Vapor of Carbon due to sudden breaking of the spot did the biz

no crax in tits

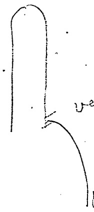
31400
5000
2)36400
~~vol~~ 18200

190
190
3)380
126 127

EMF	220 - 218	146 Volts 176 Ohms
R	$\frac{31400 + 35700}{200}$	+ 8
C	48	5360
EMF	190 - 190	
R	$\frac{31400\ 5000}{200}$	
C	16	

61

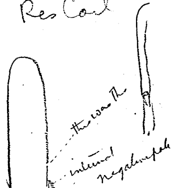
lit on negative fused at top



very slightly brighter

Busted here.

Arc sprung Res Coil burned



No blue on clamps

this was the internal negative pole

6 thus arc still holds

~~plat fuses~~

170
170
3140
713

170
3140
2 | 331
165

62

Ent 200 – 200 133 Volts

R $\frac{31400}{200}$ 157 ohms

C 48 + 24

4990

Ent 170 – 170

R $\frac{1700 + 31400}{200}$

C 16

62 [illegible]

No blue at clamp

~~no nothing~~
Res burned clamp melted
to Positive. Arc sprung
was a split in the clamp
as I think Carbon was
OK Except inside clamp
at negative End

63

31400
7500
38900
194

198
198
396
13.2

Ced 7	230–228	153 Volts 184 Ohms
R	$\frac{31400 + 5500}{200}$	
C	48	5603
	198–198	
R	$\frac{7500 + 31400}{}$	
C	16	

'63 - lotta unequal

Blue at clamp

No Resistance

The resistance of
This is too light

64 – [illegible]

spots
slightly blue and damp

No Res [illegible]
Glass [illegible]

192
192
3 | 384
128

65

Out 225 – 225 150 Volts
180 Ohms

R $\frac{31400 + 4700}{200}$ + 3

5540

C 48
little Blue in Globe

Out 192 – 192

R $\frac{31400 + 6200}{200}$

C 16

65

Slightly blue on Clamp

Burned here = Res Coil burned - not blue at 1st but on last count slightly blue =

$$\begin{array}{r} 31400 \\ 4500 \end{array}$$

$2 \overline{)35900}$

179

$$\begin{array}{r} 175 \\ 180 \end{array}$$

$3 \overline{)355}$

118

Emf 217 217 145 Volts 170 Ohms

R $\frac{31400+2600}{200}$

C 48 +91 5460

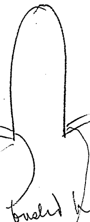
Emf 175 – 180

R $\frac{31400+4500}{200}$

C 16

67.

no crax lits



do

little brighter
profound at
negative

brushed line - globe gate

black no arc Reo Coal

OK

I notice a split line

clamp no split
medium gray
position

Blue on clamp

205
205
410
136.7

25150
2200
27350
136.7

25150
3800
28950
144.7

160
162
322
161

25150
3800
28950
144.9 145
95

67

Exp 190 – 190 127 Volts
137 Ohms

R $\frac{25150 + 2200}{200}$ + 28

C 48

5220

Exp 160 – 162

R 25150 + 3800

C 16

This is the A^x lamp
Ja

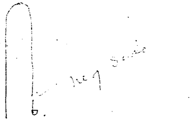
67

No spots

No blue arc clamp

no noise

Reo burned pos clamp
melted. Carbon broke



Carbon fluff on neg clamp.
& angle 60° towards negative side

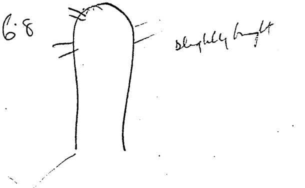
31400
5900
2|37300
186

182
182
2|364
121

68

Cut	222–225 149 Volts 175 Ohms
R	$\frac{31400+3700}{200}$
C	48 +5 ✓ 5620
Cut	182–182
R	$\frac{31400+5900}{200}$
C	16

6·8



busted here. Res Coil Burned
arc sprung -

Blue at clamps

25150
4300
29450

200)29450(147

2)320(160

Emf 195 - 195 130 Volts
140 Ohms

R $\dfrac{25150 \cancel{+2500}}{200}$

+ 25 ✓

C 48

5350

Emf 160 - 160.

R $\dfrac{25150 + 4300}{200}$

C 16

20 Lot-2

90

69 no spot,

No blue at clamp

marked split at clamps on label

11.52 a.m
Oct 16-80

Res O.K.

44 88 132 176

35.64 35.6 35.6
71.2 106.8 142.4

1 ohm = 41

1 ohm	2 ohm	3 ohm	4 ohm
44	88	132	176

.9

35.6 71.2 . 106.8 . 142.4

156 ohm 125 V = 4400
100 100 V = 4400

.9

20
.9
18.0

10) 156 (15.6
10
56
130.4

130
130
3900
130
16900
441
67600
67600

156) 74360 0 (4766
624
1196
1092
1040
936
1040

156
4
624

10) 135 (12.5
25

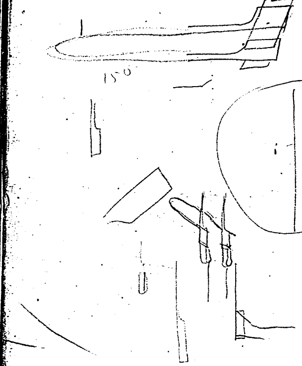
90
90
8100
44
32400
3240
35640

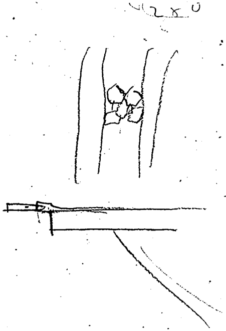
18.

112
112
224
112
112
12544
4
50176
50170

156) 55164 (3537
468
838
780
583
468
1156
1092
64

1 Volt = 100000000 units of Pot





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Centimeter

Inches